General Information

V3 Mechanism - Also Covers V 857B

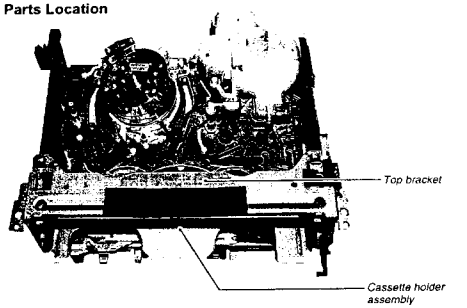
Recommended Safety Parts

Item	Part No.	Description		
0001C	70061667	Owners Manual English		
0014C	70012604	Power Cord		
0250	70051879	Front Panel		
0350	70051766	Bottom Plate		
0400	70824403	Top Cover		
RN441	70041571	Res. Fusible	18Ω	J 0. 3W
RS045	70041671	Res. Fusible	18Ω	J 0. 3W
RT089	70040122	Res. Carbon	1Ω	J 0. 3W
RW012	70041074	Res, Fusible	27Ω	J 0. 3W
RW021	70040122	Res. Carbon	1Ω	J 0. 3W
RW030	70041116	Res. Fusible	39Ω	J 0. 3W
0060M	70051878	Back Panel		
LP002	70011949	Line Filter		
LP020	70012519	Power Transformer	SRN2924ED	
CP001	70042150	Cap, Plastic	100nF	M
CP002	70041888	Cap Electrolytic	100μF	M 385V
CP003	70051555	Cap	2.2nF	400V
RP018	70042048	Res. Metal	0.82Ω	K 0. 4W
RP021	70041673	Bes, Fusible	2. 2kΩ	J 0. 3W
RP041	70042246	Res, Fusible	0. 22Ω	
RP058	70042046	Res. Chip	100Ω	J 0. 3W
RP071	70041073	Res, Fusible	22Ω	J 0. 3W
RP091	70042248	Res	1. 5Ω	
RP092	70041116	Res, Fusible	39Ω	J 0. 3W
RP100	70041946	Res	680Ω	420V
BP001	70011176	Inlet		
FP001	70010445	Fuse, 1A, 250V		
(V-856B Only)				
0001C	70061667	Owners Mnual English 1		
0014C	70012504	Power Cord		
0250	70051879	Front Panel		
0350	70051756	Bottom Plate		
0400	70824403	Top Cover		
RP092	70041116	Res, Fusible 39Ω J 0. 3W		
0001C	70061929	Owners Manual English		
0014C	70012731	Power Cord		
0250	70051996	Front Panel		
RP092	70040125	Res, Carbon 47Ω J 0. 3W		

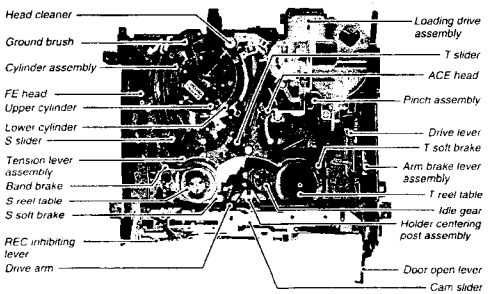
Adjustment Procedures

1. Mechanical Adjustment

1-1. Mechanical Parts Location



Top View



1-2. Servicing Jig List

Alignment tape
70909409 (ST-C6)
70909410 (ST-C7)

Back tension cassette gauge
70909103

Torque cassette gauge (KT-300NR)
70909199

Taper nut driver
70909228

VTR cleaning kit
VTR lubrication kit
Grease

Note: Conventional alignment tapes ST-C1 (70909227) and ST-C3 (70909264) can be used partially.

1-3. Main Parts Servicing Time

- Part replacement time differs from servicing life time of each part.
- Following table is prepared based on a standard condition (room temperature, room humidity). The replacement time will be varied depending upon operation environment, using methods, operation duty, etc.
- Particularly, life of the upper cylinder depends upon operation conditions.

	Part Name	Service time (Operating Hours) 500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Note
Tape Transport System	Tension post											• When cleaning, use a swab or piece of gauze soaked in alcohol.
	S/T slant guide post											
	Impedance roller *											
	No. 8 guide post	△	△	△	△	△	△	△	△	△	△	• After cleaning, cleaned parts are dried completely, and then load a video cassette.
	Capstan											
	No. 9 guide post											
	No. 3 guide post											
	S/T guide roller	△	△	△	o	o	o	o	o	o	o	• When lubricating, always use the specified oil.
	Upper cylinder	△	o	o	o	o	o	o	o	o	o	
	Slip ring assembly		o	o	o	o	o	o	o	o	o	• When the lubricating, apply one or two drops of oil after the cleaning with alcohol.
	FE head	△	△	△	o	o	o	o	o	o	o	
	ACE head	△	o	o	o	o	o	o	o	o	o	
	Pinch roller	△	o	o	o	o	o	o	o	o	o	
Tape Drive System	Capstan motor	△	△	△	△	△	o	o	o	o	o	
	Loading motor				o	o	o	o	o	o	o	
	Loading belt/ Reel belt	△	o	o	o	o	o	o	o	o	o	
	S reel table assembly		o	o	o	o	o	o	o	o	o	
	T reel table assembly		o	o	o	o	o	o	o	o	o	• Check the back tension.
	Idle gear assembly	△	o	o	o	o	o	o	o	o	o	
Other	Band brake assembly		o		o		o		o		o	

△ : Cleaning O : Check and replace if necessary
* There are two types. One type has an impedance roller and another type has no impedance roller.

1-4. V3 Mechanism Check Method

If the abnormal condition is caused by the mechanism itself, analyze the cause according to the following procedures.

1-4-1. External Appearance check

1) Check whether there are foreign matters or not inside the VTR.
2) Check whether the cylinder and the guides for tape transport system are contaminated.

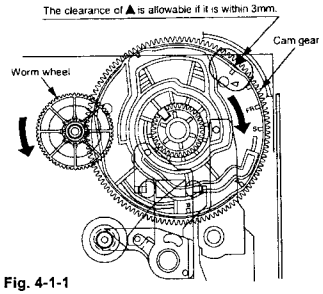
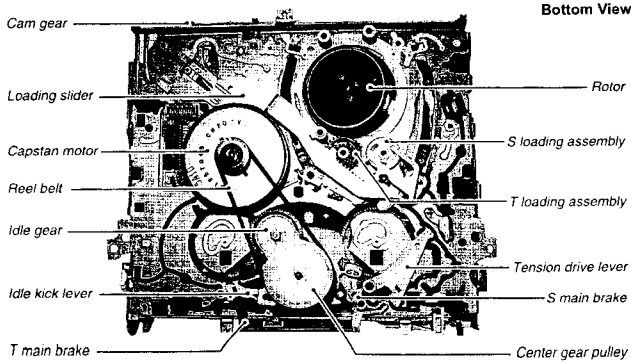


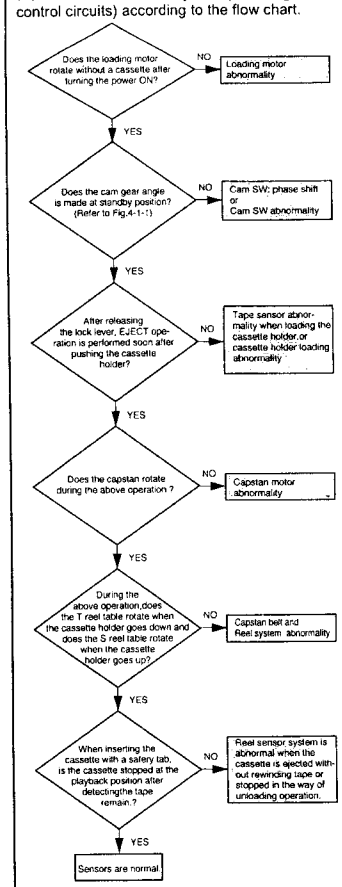
Fig. 4-1-1

Bottom View



1-4-2. Motor Sensor System check

Check whether some abnormalities are found in the motor or the sensor system (including control circuits) according to the flow chart.


Does the loading motor rotate without a cassette after turning the power ON?
NO
Loading motor abnormality
YES
Does the cam gear angle is made at standby position? (Refer to Fig.4-1-1)
NO
Cam SW; phase shift or Cam SW abnormality
YES
After releasing the lock lever, EJECT operation is performed soon after pushing the cassette holder?
NO
Tape sensor abnormality when loading the cassette holder,or cassette holder loading abnormality
YES
Does the capstan rotate during the above operation ?
NO
Capstan motor abnormality
YES
During the above operation,does the T reel table rotate when the cassette holder goes down and does the S reel table rotate when the cassette holder goes up?
NO
Capstan belt and Reel system abnormality
YES
When inserting the cassette with a safety tab, is the cassette stopped at the playback position after detectingthe tape remain ?
NO
Reel sensor system is abnormal when the cassette is ejected without rewinding tape or stopped in the way of unloading operation.
YES
Sensors are normal.

1-4-3. Abnormality Analysis by Self-check Function

The unit used V3 mechanism has a self-check function.
The self-check function works as a system which stored some abnormal condition. So, use this function to try to analyze the cause(s).

For the data display method and the content of the data, refer to the self-check function in item 2-3.

Note:

- Abnormal data is displayed only when the first abnormal condition occurs, and is not displayed in the second time. Accordingly, the claim from customers and the actual data displayed may be different.
- The data is stored only when the power turns off after occurring the abnormality condition(s). The data is not stored when the unit operation is recovered by the microcomputer.
- After repairing, initialize the data by pressing the [COUNTER RESET] button while displaying the abnormal mode. The typical examples in abnormal condition are shown **(See Table 4-3-1).**

1-4-4. Check by Defective Analyzing List

If the abnormality causes the mechanism abnormal condition, presume, confirm and treat the defective according to the "Defective analyzing list" in **Table 4-4-1**.

1) Manual mechanism operation (mode shift) method

Push in the lock lever R and L manually and turn the worm wheel counterclockwise as shown in **Fig. 4-1-1**. The cam gear is turned clockwise and the mode shifts to the direction where the loading operation can be performed. So, check the mechanism condition in the defective mechanism position when the abnoimality occurs.

2) Defective parts replacement

When a defective occurs due to the defective part(s) and the part(s) is replaced, take care the following items.

• Especially as for the mechanical parts requiring the phase alignment, take care of the part replacement **E.g.**. Assembling mode, phase alignment mark and etc.
• As for the part(s) requiring lubricant such as a specified amount of oil or grease, apply grease or oil according to the instructions and do not stick grease or oil to the portions without allowing to stick it (especially in removal and assembly).

3) Check after treating the defective

After replacing a defective part andlor aligning a part, first check the mechanism operation manually and confirm that no problem occurs, and then mount the mechanical (leek, turn the power ON and check the mechanism operation.

Note:

- After replacing the defective parts according to the procedure of the treatment method for the damage and phase shift of mechanical part", check the operation of the mechanism again, since the same (or similar) defective problem may occur due to other serious cause (in mechanism or electrical circuit) when performing the actual total check with turning the power on.

Continues Next Page...

A	B	C	Abnormal Condition	Check Item
06	01	09	Cylinder is stopped at playback position during playback the tape.	Check the cylinder motor. Check if the cylinder and tape transport guide are clogged.
02	01	06	Cylinder is stopped at FF/REW position during rewind the tape.	
06	02	09	T reel sensor is abnormal at playback postion during playback the tape.	Check the capstan motor. Refer to the cases 2 and 3 describe on the table "Defective analyzing list".
03	03	07	S reel sensor is abnormal at playback position during REVIEW the tape.	
01	04	02	Cassette-in and out operation cannot be performed.	Refer to the case 1 described on the table "Defective analyzing list".
03	05	08	Mode shift cannot be performed during shifting to REVIEW.	

Table 4-3-1

Mechanical Adjustments Cont'd

Table 4-4-1 Defective Analyzing List

Case	Detective Phenomenon (Main Items)	Presumed Cause (Main Cause)	Check Method
1	Power does not turn on. Loading operation is defective. Mode shift operation is defective.	<General> Mechanical stops due to mechanical phase unmatching.	Check mode shift "Cassette out FE/REW position" can be pertormed when turning worm wheel.
	Loading operation is not performed.	Loading motor does not rotate. (Loading motor is defective or circuit is detective.)	Check loading motor whether it turns by the outer power supply (12.5V).
	Unloading operation is not performed.	S reel does not wind the tape.	Refer to case 3 in this table.
2	Playback operation is not performed. Playback operation is defective.	<General> Main brake is not released. (ON) T soft brake is not released. (ON) Idler does not swing. Pinch does not press.	Check mechanical position.
		Capstan motor does not rotate. (Capstan motor is defective or circuit is defective.)	Check capstan motor.
	Playback picture does not appear. Video recording can not be performed.	<In case of no mechanical problem> Cylinder is defective. (Circuit is defective.)	Check cylinder assembly.
3	Playback interruption. Detective phenomenon during playback. Recording interruption.	Reel rotation detection is defective. (Sensor is defective. Circuit is defective.)	Check sensor output.
		Idler does not swing.	Check mechanical position.
		Reel belt is removed.	Check the reel belt is removed or not.
4	FF operation is not performed. FF operation is defective. REW operation is not performed. REW operation is defective. Others: REV/FF is not performed. Others: REV/FF is defective.	Main brake is not released. (ON) T soft brake is not released. (ON) Idler does not swing. Pinch is not released.	Check mechanical position.
		Capstan motor does not rotate. (Capstan motor is defective or circuit is defective.)	Check capstan motor.
5	REVIEW is not performed.	Main brake is not released. (ON) T soft brake is not actuated. Idler does not turn. Pinch does not press.	Check mechanical position.
		Capstan motor does not rotate. (Capstan motor is defective or circuit is defective.)	Check capstan motor.
6	Slot-in is not performed. Cassette can not be inserted.	<General> When the F/L is mounted on the mechanical deck the position is not correct.	Check mechanical position.
7	Capstan servo does not work. Capstan servo is uneven. Tape speed is fast. Tape speed is slow. Tape speed is uneven. EG pulse is not output.	Capstan motor is defective.	Check capstan motor.
		ACE head control output is defective. (Circuit is defective.)	Check ACE head. Check CTL output.
8	Audio output does not come out. Audio output is small. Audio output variation is large. Audio output is uneven. Audio distortion. Audio noise. Others: Audio is defective.	ACE head is defective.	Check ACE head. Check CTL output.
		Tape transport adjustment is not defective.	Perform tape transport adjustment again after confirming tape transport condition.
		Hi-Fi head (cylinder) is defective. (Circuit is defective.)	Check cylinder. Check whether B+14V is supplied.

Treatment: If the mechanical is found out to be defective according to the procedures described above, perform the following treatment.
- Misassembling, mechanical phase mismatch .....Repair correctly.
- Parts defect, parts damage ..... Replace parts.

If the mechanical is found out not to be defective according to the procedures above, check the circuit(s).

1-5. Mechanical Deck Removal and Mounting

1-5-1. Mechanical Deck Removal

1 Remove three screws (2) mounting the top cover (1) and unlock two hooks at both left and right of the rear side, then remove the top cover sliding backward and lifting upward.
2. Remove left and right insulators. Insulators (A) can be remove by unfastening the hook of the chassis inserting a bar into the hole (B) located on the bottom, and by sliding it to the arrow mark direction.

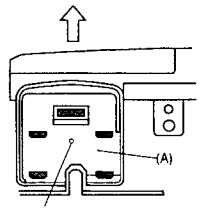


Fig. 5-1-1

3. Remove the connector (4) (KDB unit side) of the JSB unit, and remove the front panel (3).
4. Remove the FFC (7) connecting between main unit (8) and KDB unit (5), lead wires (9) and (10) connecting between terminal unit (1 2) and FCB unit (6), lead wire (11) connecting between main unit (8) and FCB unit (6). Remove lead wire (13) between a mechanical deck (14) and FCB unit (6) by loosening screw (15).

Note:
In this case, remove FFC (7) on KDB unit (5) side, lead wire (9) on FCB unit (6) side and lead wire (1 3) on mechanical deck (14) side.

6. Remove a screw (1 8) securing the mechanical deck (14).
7. Undo the hook of the Terminal board (20) by pressing it and lift it up.

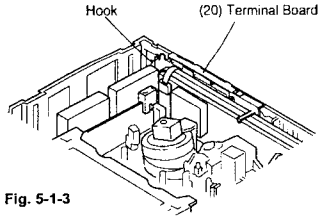


Fig. 5-1-3

8. Remove the mechanical deck (14) with main unit (8) from the chassis liftino its rear side slightly and pulling it upward.

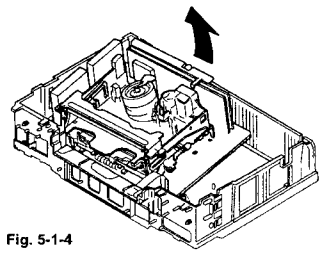


Fig. 5-1-4

Note:
When pulling the top bracket upward, take care not to deform the reinforcement plate located below the F/L assembly.

9. Remove the lead wire connecting between the mechanical (leek (14) and the main Linit (8).
10. Tum over the mechanical (leek (14).

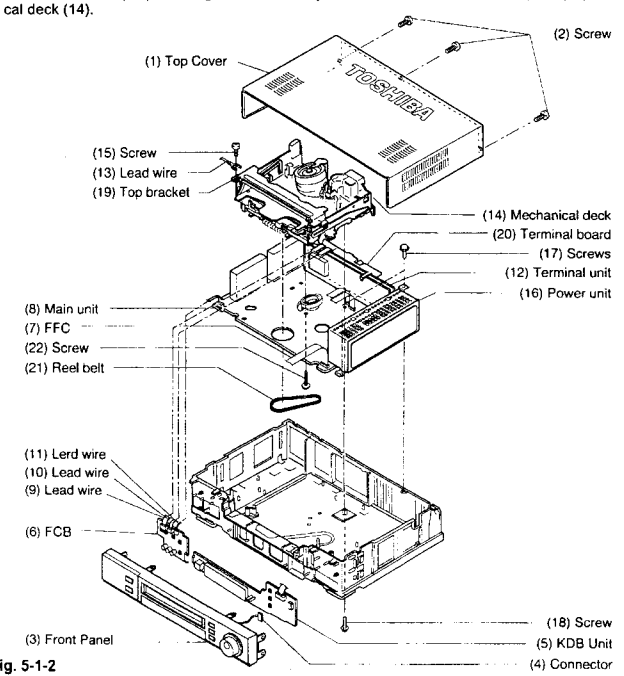


Fig. 5-1-2

11. Remove the reel belt (21) and one screw (22).
12. Remove four claws securing the mechanical deck (14) and the main unit (8), and then remove the main unit (8) pulling upward.

1-5-2. Mechanical Deck Mounting

Turn over the mechanical deck and lower the main unit vertically adjusting the tape end sensor and etc. to the holes.

Note:
- Adjust the rotor of the cylinder motor and the stator of the main unit,and then lower the main unit further more till four claws catch the mechanical deck completely.
- Take care not to damage the rotor and the stator.
- When locking the claw of the front right side to the main unit, turn the REC inhibit lever so as not to damage the switch.

2. Mount the mechanical deck on the chassis in reverse order of removal.

Note:
When mounting the front panel, mount it with its door fully open.

1-5-3.Confirmation of Each Operation Mode without Cassette

1. Shut out the light to the start/end sensor.
2. Release the both sides of the lock lever and make a slot-in condition.
3. Turn the reel table manually located on the opposite side of the rotating reel table.
4. In this condition, confirmation of each operation mode can be performed.

Note:
When turning the opposite side reel table of the rotating reel table manually in playback, FF/REW mode, and sending no reel pulse. the auto eject or power off function is performed.

1-6. Main Parts Replacement

1-6-1. Top Bracket Replacement

1. Remove two securing screws (2) on the top bracket (1).
2. Remove the top bracket (1) lifting in the direction shown by the arrow.

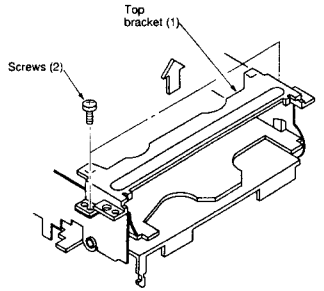


Fig. 6-1-1

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Mechanical Adjustments Cont'd

3. When mounting the top bracket (1), move the tip of the grip lever (3) on the cassette holder assembly to the inclined portion of a trapezoidal cam, and then mount the top bracket (1).

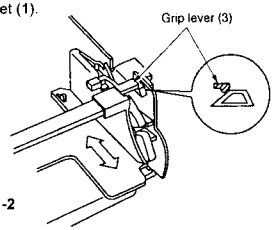


Fig. 6-1-2

Note:
- After remounting the top bracket (1), move the cassette holder forward and backward, and then confirm the claws of the lock lever (5) catch completely the both left and right sides of the stopper section (4) at the top bracket (1)

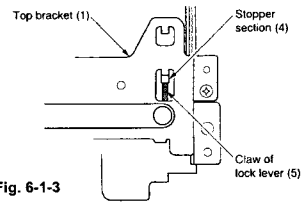


Fig. 6-1-3

1-6-2. Cassette Holder Assembly Replacement

1. Remove the top bracket. (Refer to item 1-6-1. Top Bracket Replacement".)
2. The cassette holder assembly (1) is guided along the guide grooves (2) with both left and right bosses of the cassette holder assembly (1). So first remove each side boss (3) on both left and right sides of cassette holder assembly (1) from the guide groove (2).
3. When the cassette holder assembly (1) is set at the EJECT position, the boss is located at (a), so move the boss from (a) to (b) and remove the bosses on both left and right sides simultaneously.

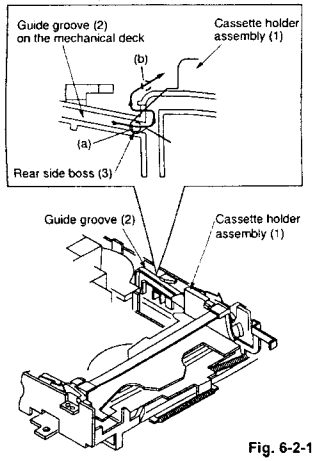


Fig. 6-2-1

Note:
The grip lever (4) on the cassette holder assembly (1) may catch the trapezoidal cam on the mechanical deck (2), so perform the work lifting the grip lever in the direction shown by the arrow.

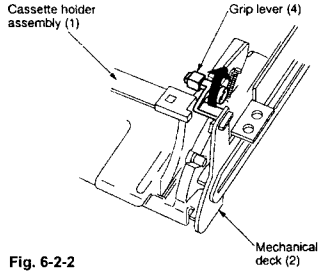


Fig. 6-2-2

4. After removing the front side bosses (5) on both left and right sides, remove the cassette holder assembly (1) pulling to the front side.
5. When mounting the cassette holder assembly (1), insert the front side bosses (5) to the U shaped groove of the drive arm (6) and the guide groove (2) on the mechanical deck lifting the rear side of the cassette holder assembly (1).

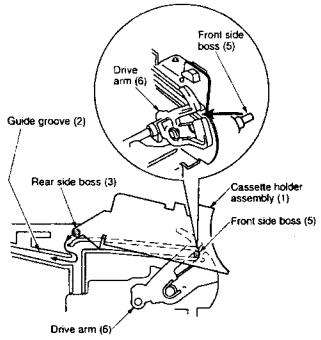


Fig. 6-2-3

6. When mounting the rear side bosses (3), perform the reverse order of removal.

1-6-3. Door Open Lever Replacement

1. Release the lock lever (2) on the cassette holder assembly (1) pressing in the direction shown by the arrow.

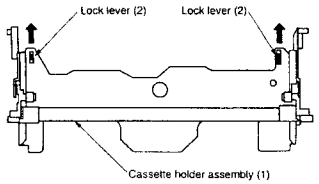


Fig. 6-3-1

2. Move the cassette holder assembly (1) slightly to the rear side.
3. Remove the claws (A) and (B) on the door open lever (3) from the mechanical deck (4).
4. Match the boss on a new door open lever (3) and the hole (C) on the mechanical deck, and then insert the claws (B) first and then (A) to the mechanical deck (4).

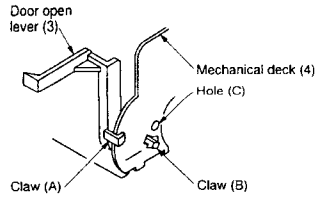


Fig. 6-3-2

5. Remount the cassette holder assembly to the position as it was.

1-6-4. Drive Lever Gear Replacement

1. Make the cassette holder assembly to the slot-out (EJECT) position.

Note:
- In this condition, both mark holes on the F/L drive slider (1) and the mechanical deck fit with each other, also the hole of the boss on the drive lever gear (2), the center of the gear tooth and the marking line are in line.

2. Move the claw of the drive arm (3) to the direction of the arrow (A) and remove the drive lever gear (2) upward.

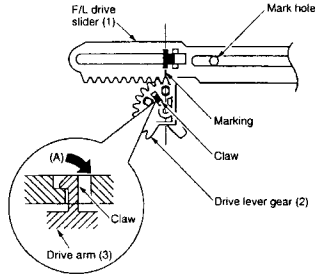


Fig. 6-4-1

3. When remounting the drive lever gear (2), take care of the phase position (refer to the note described above.) and mount in the reverse order of removal.

1-6-5. Drive Arm Assembly Replacement

1. Remove the top bracket assembly. (Refer to item "1-6-1. Top Bracket Replacement".)
2. Remove the cassette holder assembly. (Refer to item "1-6-2. Cassette Holder Assembly Replacement".)
3. Remove the door open lever. (Refer to item "1-6-3. Door Open Lever Replacement.")
4. Remove the drive lever gear. (Refer to item "1-6-4. Drive Lever Gear Replacement".)
5. Pull the REC-inhibiting lever slightly to the front side, turn the drive arm assembly (1) to the front side and push it in the direction shown by the arrow. Remove the left side boss (2) on the drive arm assembly (1) from the cutout of the guide groove on the mechanical deck (3).
6. Remount the drive arm assembly (1) in the reverse order of removal.

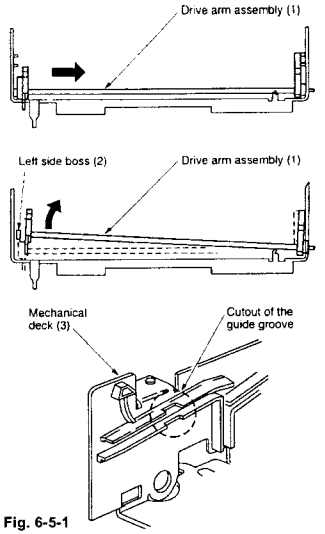


Fig. 6-5-1

1-6-6. Cam Lever Replacement

1. Remove the top bracket. (Refer to item "1-6-1. Top Bracket Replacement".)
2. Remove the cassette holder assembly. (Refer to item "1-6-2. Cassette Holder Assembly Replacement".)
3. Remove the cam slider. (Refer to item "1-6-41. Cam Slider Replacement".)
4. Remove the loading drive assembly. (Refer to item "1-6-29. Loading Drive Assembly Replacement".)
5. Remove the drive lever. (Refer to item "1-6-40". Drive Lever Replacement".)
6. Remove the pinch roller assembly. (Refer to item "1-6-21. Pinch Roller Assembly Replacement".)
7. Remove the cam gear. (Refer to item "1-6-31. Cam Gear Replacement".)
8. Move the cam lever (1) until it stops in the direction shown by the arrow (A). Pull out the cam lever (1) lifting up straightly at the position where the cam lever (1) stops.
9. Apply grease to the portions of bosses (A) to (C) on a new cam lever.

Note:
- Confirm that the boss (A) on the cam lever (1) is inserted into the hole on the F/L drive slider (2).
- After inserting the cam lever (1), confirm that the cam lever (1) moves smoothly.

10. Replace the cam lever in the reverse order of removal.

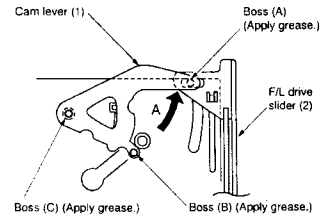


Fig. 6-6-1

1-6-7. F/L Drive Slider Replacement

1. Remove the top bracket. (Refer to item "1-6-1. Top Bracket Replacement".)
2. Remove the cassette holder assembly. (Refer to item

1-6-2. Cassette Holder Assembly Replacement".)

3. Remove the cam slider. (Refer to item "1-6-41. Cam Slider Replacement".)
4. Remove the loading drive assembly. (Refer to item 1-6-29. Loading Drive Assembly Replacement".)
5. Remove the drive lever. (Refer to item "1-6-40. Drive Lever Replacement".)
6. Remove the pinch roller assembly. (Refer to item 1-6-21. Pinch Roller Assembly Replacement".)
7. Remove the cam gear. (Refer to item "1-6-31. Cam Gear Replacement".)
8. Remove the cam lever. (Refer to item "1-6-6. Cam Lever Replacement".)
9. Remove the drive lever gear. (Refer to item "1-6-4. Drive Lever Gear Replacement".)
10. Push the F/L drive slider (1) in the direction shown by the arrow (A) and slide it. Furthermore, pull out it to the front side lifting it in the direction shown by the arrow (B).
11. Apply grease to the shaded parts (a) to (d) on a new F/L drive slider (1).

Note:
For the phase alignment of the drive lever gear, refer to item "1-6-4. Drive Lever Gear Replacement".

12. Replace the F/L drive slider (1) in the reverse order of removal.

Note:
After completion of the replacement, confirm that the F/L drive slider (1) moves smoothly.

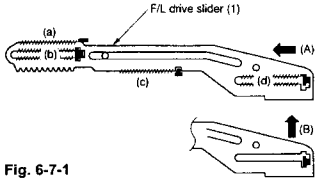


Fig. 6-7-1

1-6-8. Arm Brake Lever Assembly and Arm Brake Torsion Spring Replacement

1. Make the cassette holder assembly to the slot-out (EJECT) position.
2. Turn the arm brake lever assembly (1) in the direction shown by the arrow (A) until it stops. Pull out the arm brake lever assembly (1) to the front at the position it stops.

Note:
Take care that the arm brake torsion spring (2) is removed forcefully.

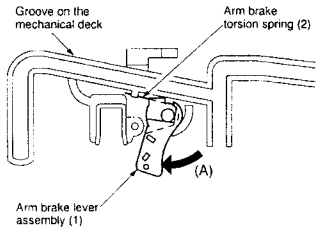


Fig. 6-8-1

3. Hook the arm brake torsion spring (2) temporarily to a new arm brake lever assembly (1).

Note:
Take care of the direction of the arm brake torsion spring (2) so that the longer end of the arm brake torsion spring (2) is hooked on the temporary hook.

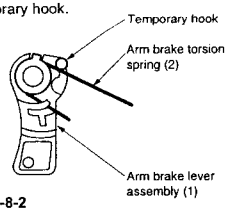


Fig. 6-8-2

4. Insert the hook portion on the arm brake lever assembly (1) to the cutout on the mechanical deck.
5. Turn the arm brake lever assembly (1) counterclockwise and fix it at the position which the arm brake lever assembly (1) faces to the straight below.
6. When pushing the tip of the arm brake torsion spring (2) located at (B) position, the tip is removed from the temporary hook and moves to the hook on the mechanical (leek.
7. The arm brake lever assembly turns to the specified position by force of the arm brake torsion spring.

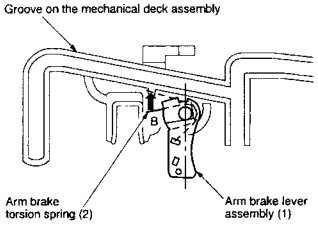


Fig. 6-8-3

1-6-9.Cylinder Assembly Inspection and Replacement

<Inspection>

1. Check if the tape transport surface on the lower cylinder assembly are not damaged.
2. Check if the rotation of the upper cylinder assembly is not abnormal. When any abnormality is found according to the inspection procedures described above 1 and 2, replace the cylinder assembly.

<Replacement>

1. Remove the ground brush assembly.
2. Remove the head cleaner. (Refer to item "1-6-14. Head Cleaner Replacement.")
3. Remove the FPC (1) on the Preamplifier.
4. Remove three screws (2) and the cylinder holding plate (3) and (4). (Refer to item "1-6-12. Cylinder Holding Plate Replacement".)
5. Remove the cylinder assembly (5).
6. Remount the cylinder assembly (5) in the reverse order of removal. Fix the cylinder pressing slightly in the direction shown by the arrow (A) and the cylinder holding plate (3) pressing slightly in the direction shown by the arrow (B). (Tightening torque: 294-392 mN•m (3 - 4 kg•cm))

Continues Next Page ...

Mechanical Adjustments Cont'd

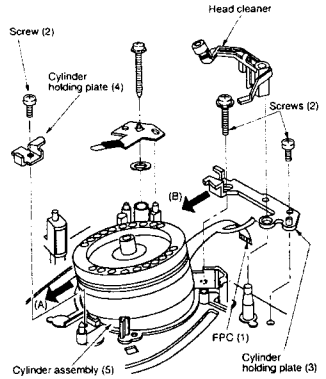


Fig. 6-9-1

Note:
- When replacing, take much care not to touch the video head directly and damage the cylinder.

7. Perform the tape transport adjustment.

1-6-10. Upper Cylinder Assembly Inspection and Replacement

<Inspection>
1. Check if the video heads are damaged or worn out.
2. Check the video heads for clogging. (In case that the clogging is not remedied after cleaning.)

<Replacement>
1. Remove the ground brush assembly.
2. Remove two securing screws (1) and remove the upper cylinder assembly (2).
3. Clean the new upper cylinder assembly (2) and the flange (3) mounting surface with a cleaning kit.
4. Align the head A (green) and the marker on the rotary transformer PC board (4) and then mount the upper cylinder assembly (Tightening torque : 294 - 392 mN•m. (3 - 4kg•cm)

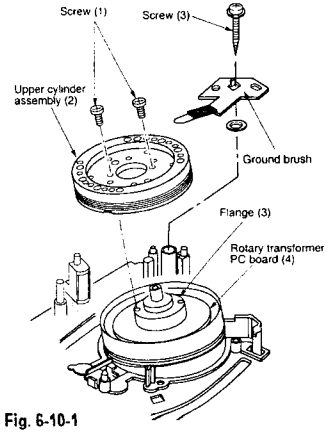


Fig. 6-10-1

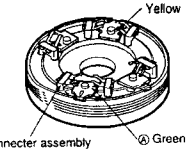


Fig. 6-10-2

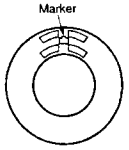


Fig. 6-10-3

Note:
- During the work in steps 3 to 4, take care not to touch the connector assembly and deform the spring.

5. Perform the tape transport adjustment according to its procedures.

1-6-11. Lower Cylinder Assembly Inspection and Replacement

<Inspection>
1. Check if the tape transport surface on the lower cylinder assembly is not damaged.
2. Check if the rotation of the upper cylinder assembly is not abnormal.
3. Check if the FPC on the Preamplifier is not damaged. When any abnormality is found under the inspection described in the steps (1) to (3), replace the cylinder assembly.

<Replacement>
1. Remove the cylinder assembly. (Refer to item "1-6-9. Cylinder Assembly Inspection and Replacement".)
2. Remove two securing screws (1) and remove the upper cylinder assembly (2).
3. Replace the lower cylinder assembly (3).
4. Mount the lower cylinder assembly in the reverse order of removal taking care not to touch the video head directly and damage the cylinder.

Note:
- Take care not to deform the joint spring on the upper cylinder assembly (2).

5. Perform the tape transport adjustment according to its procedures.

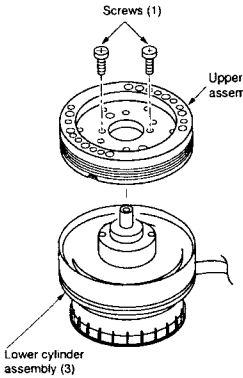


Fig. 6-11-1

1-6-12. Cylinder Holding Plate Replacement
1. Remove screws (1) and (2) securing the cylinder holding plate (3) and a screw (5) securing the cylinder holding plate (4).
2. Remove the cylinder holding plate (3) and (4) sliding in the direction shown by the arrow (B) and (A).
3. Eliminate the cylinder lock key (wedge shaped parts).
4. After replacing the cylinder holding plates (3) and (4), mount new parts in the reverse order of removal.

Note:
- When remounting, fix the cylinder while pushing in the direction shown by the arrow (A) and the cylinder holding plate (3) in the direction shown by the arrow (B). Then tighten three screws while pushing the cylinder holding plate (4) toward the stopper on the outsert of the mechanical deck.
- Tightening order of the screws is (1) > (2) > (5).
- Tightening torque of the screws (1), (2), (5) is 294 - 392 mN•m (3 - 4 kg•cm).

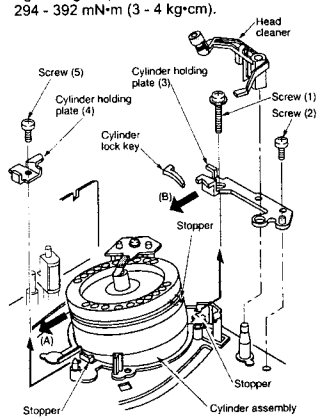


Fig. 6-12-1

1-6-14. Head Cleaner Replacement

<Roller sub assembly replacement>
1. Remove the roller sub cleaner assembly (2) pulling upward from the hook (A) on the cleaner lever (1).
2. After replacing the roller sub assembly, mount in the reverse order of removal.

<Cleaner lever replacement>
1. Undo the hook (B) of the cleaner lever (1) from the mechanical deck, and pull out the cleaner lever (1) upward.
2. Replace the cleaner lever (1) on the roller sub assembly (2), and mount the cleaner lever (1) in the reverse order of removal.

Note:
- Take care the roller sub assembly (2) is not stained with grease or oil.

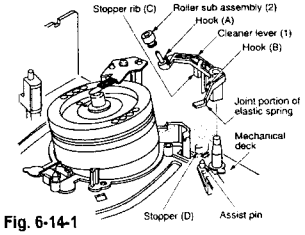


Fig. 6-14-1

Note:
- When remounting the head cleaner, position the stopper rib (C) in front of the stopper (D).

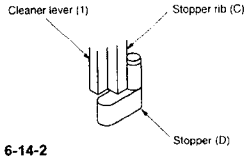


Fig. 6-14-2

Note:
- Confirm that the joint portion (E) of the elastic spring positions in front of the assist pin (F) on the cleaner assist lever (4).

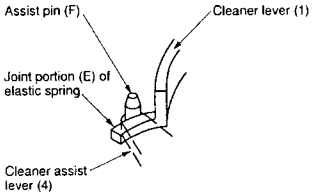


Fig. 6-14-3

1-6-15. No. 8, No. 3 Guide Sleeves Replacement
1. When replacing the No. 8 guide sleeve (1), first remove the guide cap (2) on the loading bracket assembly.
2. Pull out the guide sleeve (1) from the guide post (3).

Note:
- Take care not to break the No. 8, No. 3 guide posts on the mechanical deck if twisting the guide sleeve forcefully.

3. Insert a new guide sleeve (1) to the guide post.

Note:
- When inserting the guide sleeve (1), take care so that its hole faces the opposite side to the tape transport surface.

4. For No. 8 guide sleeve, insert the No. 8 guide cap (2) onto it.

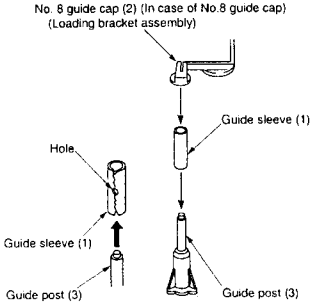


Fig. 6-15-1

1-6-16. ACE Head Assembly Replacement.

1. Remove the FFC (1) from the connector.
2. Remove two screws (2) and remove the ACE main base (3) and ACE head assembly (4).
3. Remove three adjusting screws (5), (6), and (7) and then remove the ACE head assembly (4).

Note:
- When replacing ACE head (9) only without replacing its PC board, unsolder the ACE head (9) on the ACE head PC board (8) and then remove the ACE head (9) and the ACE head PC board (8).

4. Mount the ACE head assembly (4) in the reverse order of removal.

Note:
- When reassembling the ACE head assembly (4), First set the ACE springs (10) between the ACE head assembly (4) and the ACE main base (3), and secure the adjusting screws (5), (6), and (7).

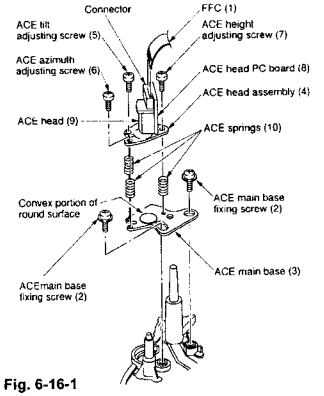

Connector
FFC (1)
ACE tilt adjusting screw (5)
ACE height adjusting screw (7)
ACE azimuth adjusting screw (6)
ACE head PC board (8)
ACE head assembly (4)
ACE head (9)
ACE springs (10)
Convex portion of round surface
ACE main base fixing screw (2)
ACE main base (3)
ACE main base fixing screw (2)

Fig. 6-16-1

- When securing three adjusting screws, mount the ACE main base (3) and ACE head assembly (4) so that the clearance between them becomes parallel with the specified preset value (4.3 ± 0. 1 mm).

5. After replacing, perform the tape transport adjustment.

Note:
- When replacing the ACE head assembly (4), always use an ACE head (9) having the same part number. Do not use any other ACE head assembly.

1-6-17. FE Head Replacement
1. Open the FE head holding hook (1) on the mechanical deck slightly in both left and right directions and remove the FE head (2) by moving in the direction shown by the arrows.
2. Replace the FE head (2) and mount the parts in the reverse order of removal.
3. Perform adjustment from the linearity adjustment item in the tape transport system adjustment.

Note:
- When mounting the FE head, Push the head backward completely.
- Though FE head (2) can be removed upward by opening the FE head holding hook (1) to both left and right directions, perform the standard replacement procedure described above since this may cause deformation of the hook.

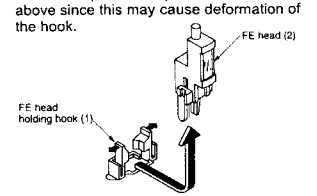


Fig. 6-17-1

1-6-18. S, T Slider Replacement
1. Remove the tension lever assembly. (Refer to item. "1-6-23. Tension Lever Assembly Replacement".)
2. Remove the loading slider. (Refer to item "1-6-25. Loading Slider Replacement".)
3. Remove the S loading assembly. (Refer to item "1-6-24. S Loading Assembly Replacement".)
4. Remove the T loading assembly. (Refer to item "1-6-24. T Loading Assembly Replacement".)
5. Remove the S slider (1) and T slider (2) lifting up to the cutout of the groove on the mechanical deck (3).
6. Remove the S and T guide rollers and mount a new slider.
7. Mount the parts in the reverse order of removal.

Note:
Perform the phase alignment between the loading slider (4) and S, T loading assemblies (5), (6) referring each replacement procedure.

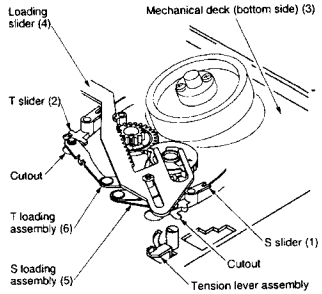


Fig. 6-18-1

8. After completion of the replacement, perform the adjustment from item I in the tape transport system adjustment.

1-6-19. S, T Guide Rollers Replacement
The same replacement procedures will be applied for the S, T guide rollers.

1. Turn the guide roller (1) counterclockwise and remove the guide roller (1) from the slider assembly (2).
2. Mount a new guide roller on the slider assembly (2) turning clockwise.
3. After completion of the replacement, perform the adjustment from the linearity adjustment in the tape transport system adjustment..

Note:
- O ring is not applied to the T guide roller.
- For the T guide roller, marking is located on the upper flange. So take care not to mismount with the S guide roller.

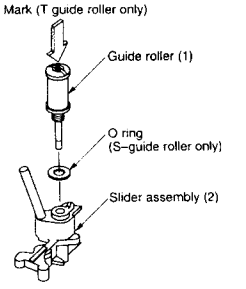


Fig. 6-19-1

Mechanical Adjustments Cont'd

1-6-20. S, T Impedance Roller Replacement

1. Remove two screws (1) and (2), and then remove two brackets (3), (4).
2. Replace two impedance rollers (5), (6).
3. Mount the parts in the reverse order of removal.
4. After completion of the replacement, perform the adjustment from the linearity adjustment in the tape transport system adjustment.

Note:

- S, T impedance rollers (5), (6) is not always applied to all models.

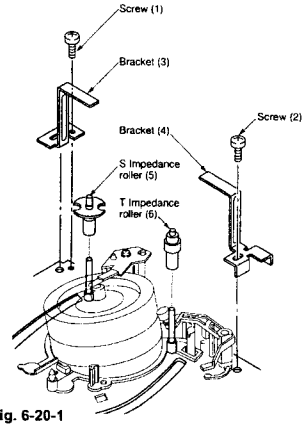


Fig. 6-20-1

1-6-21. Pinch Roller Assembly Replacement

1. Remove the loading drive assembly (Refer to item "1-6-29. Loading Drive Assembly Replacement".)
2. Remove the pinch assembly (1) lifting vertically from the pinch post (2).
3. Remove the pinch spring (5) from the hooks on the pinch drive assembly (3) and the pinch lever assembly (4).
4. Turn the projection (A) on the pinch drive assembly (3) counterclockwise till it goes to the cutout on the pinch lever assembly (4).
5. After replacing, mount the parts in the reverse order of removal.
6. After completion of the replacement, perform the tape transport adjustment.

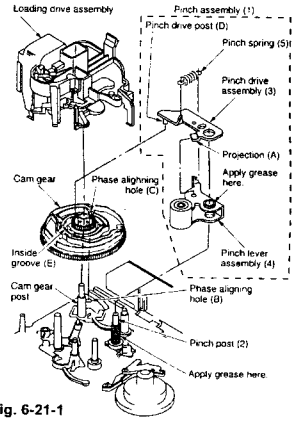


Fig. 6-21-1

Note:

- For the removal and assembling of the loading drive assembly, refer to item 1-6-29.
- When inserting the pinch assembly (1) into the pinch post (2), insert it so that the pinch drive post (D) enters the groove (E) inside the cam gear.
- Take care not to touch the surface of the pinch roller and the grease is not stained on it.
- Be sure to apply grease to the surface of the bar-ring on the pinch lever assembly (4) and the pinch post (2) on the mechanical deck.

1-6-22. No. 9 Guide Lever Assembly Replacement

1. Remove the loading drive assembly. (Refer to item "1-6-29. Loading Drive Assembly Replacement".)
2. Remove the drive lever. (Refer to item "1-6-40. Drive Lever Replacement".)
3. Remove the pinch assembly. (Refer to item "1-6-21. Pinch Roller Assembly Replacement".)
4. Remove the ACE head assembly. (Refer to item "1-6-16. ACE Head Assembly Replacement".)
5. Remove the cam gear (2) from the cam gear post (1).
6. Remove the T soft brake spring (3).
7. Remove the No. 9 guide lever assembly (4) lifting the No. 9 guide lever assembly upward from the No. 9 guide post (5).
8. After replacing, mount the parts in the reverse order of removal.
9. After completion of the replacement, perform the tape transport adjustment.

Note:

- When mounting the No. 9 guide lever assembly (4), confirm that (A) side of the No. 9 guide lever assembly (4) touches the capstan motor housing portion.
- After inserting the No. 9 guide lever assembly (4) into the No. 9 guide post (5). confirm that the lower projection of the No. 9 guide lever assembly (4) touches to the upper surface of the mechanical deck.
- Take care that the grease is not stained on the No. 9 guide post of the No. 9 guide lever assembly (4).
- Be sure to apply grease to the No. 9 guide post (5).

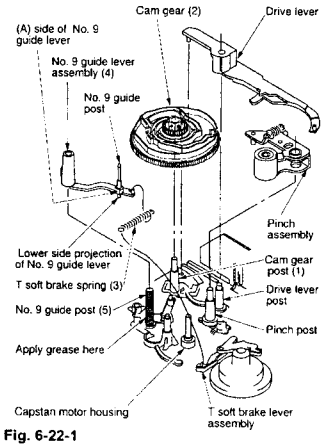

Cam gear (2)
Drive lever
(A) side of No. 9 guide lever
No. 9 guide lever assembly (4)
No. 9 guide post
Pinch assembly
Lower side projection of No. 9 guide lever
Cam gear post (1)
T soft brake spring (3)
Drive lever post
No. 9 guide post (5)
Pinch post
Apply grease here
Capstan motor housing
T soft brake lever assembly

Fig. 6-22-1

1-6-23. Tension Lever Assembly, Band Holder and Band Brake Replacement

1. Remove the tension spring (1).

Note:

- Take care not to extend or deform the tension spring.

2. After setting the band brake adjuster to the band holder assembling position, undo the claw of the snap-fit type and remove the band holder from the band brake adjuster by lifting it upward.

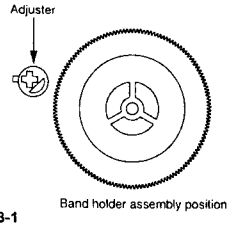


Fig. 6-23-1

Detail of band holder assembling

3. Undo the claw of the outsert on the mechanical deck catching the shaft of the tension lever assembly (3) and remove the tension lever assembly lifting it upward.
4. Remove the band brake (5) from the reel table while pulling the S soft brake lever (4) in the direction shown by the arrow.
5. Remove the band brake (5) from the hook on the tension lever assembly (3).

Note:

- Take care not to contaminate, bend or damage the felt surface on the band brake (5).

6. After replacing the tension lever assembly (3), clean the shaft on the tension lever and apply a small amount of oil.
7. Mount the parts in the reverse order of the removal.
8. After mounting, check the tension post position and perform the adjustment and back tension check.
9. After completion of the replacement, perform the adjustment from the linearity adjustment in the tape transport system adjustment.

Note:

- The band holder (2) can be replaced in the procedures described above steps 1 to 3.
- The band brake (5) can be replaced in the procedures described above steps 1 to 5.
- When replacing the band holder (2) and band brake (5), the linearity adjustment is not necessary.

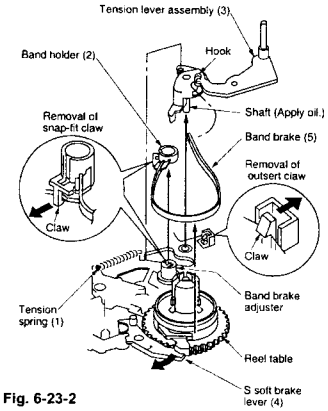


Fig. 6-23-2

1-6-24. S,T Loading Assembly Replacement

1. Remove the mechanical deck assembly from the main PC board.
2. Set the mechanical position to the F/L out position (front side). Turn over the mechanical deck.
3. Remove the loading slider assembly. (Refer to item "1-6-25. Loading Slider Assembly Replacement".)

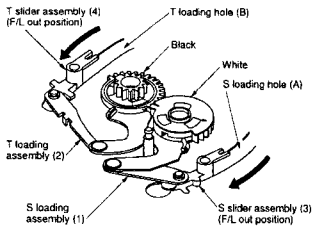

T slider assembly (4) (F/L out position)
T loading hole (B)
Black
White
S loading hole (A)
T loading assembly (2)
S loading assembly (1)
S slider assembly (3) (F/L out position)

Fig. 6-24-1

4. Remove the S, T loading assemblies (1), (2).
5. Insert the S, T slider assemblies (3), (4) along the cutout of the S, T loading holes (A) and (B) on the mechanical deck and set the S, T slider assemblies (3), (4) to the loading position (rear side).
6. Insert the T loading assembly (2) to the post (C) on the T slider assembly (4) and the post (D) on the mechanical deck. And insert the S loading assembly (1) to the post (E) on the S slider assembly (3) and the post (F) on the mechanical deck.

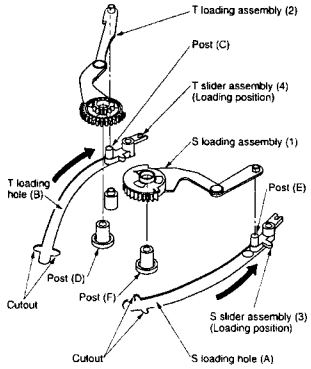


Fig. 6-24-2

Note:

- Align the phases of the s marks on the S, T loading gear (1), (2).

7. Set the S, T slider assemblies (3), (4) to the F/L out position.

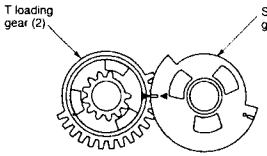


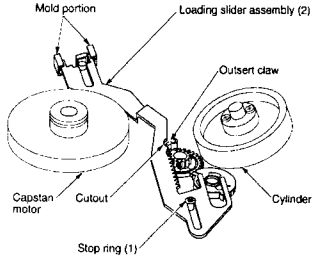
Fig. 6-24-3

1-6-25. Loading Slider Assembly Replacement

1. Remove the mechanical deck from the main PC board.
2. Set the mechanical position to the F/L out position.
3. Turn over the mechanical deck.
4. Remove the stop ring (1).
5. Remove the loading slider assembly (2) while lifting its tip upward using the mold portion on the loading slider assembly (2) as a fulcrum.
6. Mount the parts in the reverse order of removal.

Note:

- When mounting the loading slider assembly (2), insert the tip of the loading slider assembly (2) slightly to the mold portion, then mount it so that the claw on the outsert is in the position of the cutout portion of the loading slider assembly.
- Confirm that the position mark on the loading slider assembly (2) and the mark on the T loading gear match each other in position.



Mechanism deck bottom side

Fig. 6-25-1

View from Mechanical deck bottom side

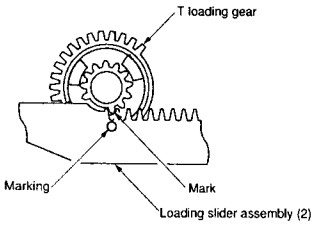


Fig. 6-25-2

1-6-26. Hook Lever Assembly Replacement

1. Remove the top bracket. (Refer to item "1-6-1. Top Bracket Replacement".)
2. Remove the cassette holder assembly. (Refer to item "1-6-2. Cassette Holder Replacement".)
3. Remove the drive arm assembly. (Refer to item "1-6-5. Drive Arm Assembly Replacement".)
4. Remove the tension spring (1).
5. Turn the hook lever assembly (2) counterclockwise slightly, and remove the claw on the hook lever assembly (2) then replace.
6. After replacing the hook lever assembly (2) , insert the (A) portion of the hook lever under the S reel table assembly. When the portions (B), (C), (D) are in line, push the claw into the mechanical deck.

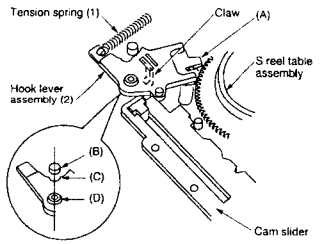


Fig. 6-26-1

7. Turn the hook lever assembly (2) clockwise till it stops, and mount the tension spring (1). After replacing the hook lever assembly (2), slide the cam slider in the direction shown by the arrow, and then position the boss (E) under the cam slider.

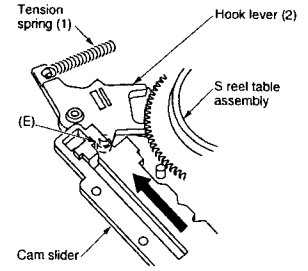


Fig. 6-26-2

1-6-27. Hook Replacement

1. Remove the hook lever assembly. (Refer to item "1-6-26. Hook Lever Assembly Replacement".)
2. Turn over the hook lever assembly (1) and remove the hook lever assembly (1) opening the portion (A) of the hook (2) slightly and lifting the hook (2) upward.
3. When mounting a new hook, push the hook (2) in the portion (B) from above.

Note:

- Take care not to confuse the mounting direction of the hook (2).

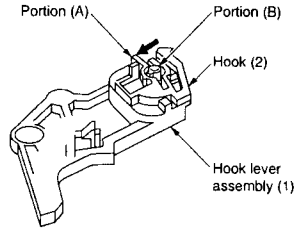


Fig. 6-27-1

1-6-28. Tension Drive Lever Replacement

1. Remove the cam slider. (Refer to item "1-6-41. Cam Slider Replacement".)
2. Turn over the mechanical deck and remove the tension drive lever (1) from the projection (A) moving counterclockwise slightly.
3. After replacing the tension drive lever (1), mount in the reverse order of removal.

Mechanical Adjustments Cont'd

Note:
• For the cam slider mounting, refer to the notes in item 1-6-41.

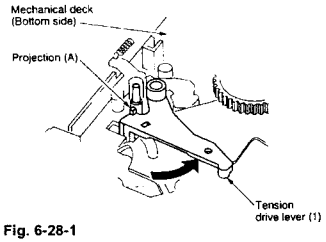


Fig. 6-28-1

1-6-29. Loading Drive Assembly Replacement

1. Remove the F/L ground plate and the head cleaner assembly. (Refer to item "1-6-14. Head Cleaner Assembly Replacement".)
2. Remove two flat cables (1) from the connectors.
3. Pull out the portion (A) (No. 8 guide cap) from the motor bracket (2).
4. Remove four claws (a), (b), (c), (d) securing the motor bracket in the order of (a) > (b) > (c) > (d).

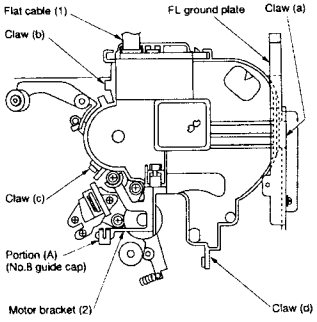


Fig. 6-29-1

Note:
• Remove the claw (a) inserting a driver.
• Remove the claws (b) and (c) pushing inside previously and opening the claws slightly.

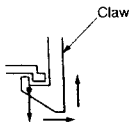
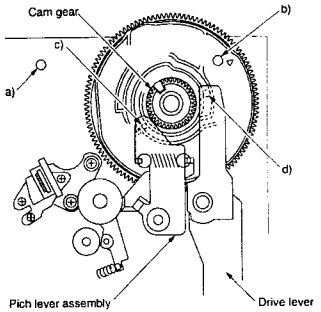
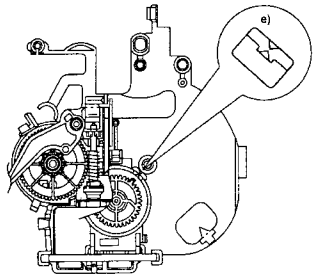


Fig. 6-29-2

<Preparation for Loading drive assembly mounting>
a) Confirm that the head cleaner assembly is removed.
b) Confirm that the small hole b) on the cam gear aligns with the hole on the mechanical deck.
c) Confirm that the clearance between the pinch lever assembly and the cam gear is approx. 0.3 mm. (Confirm that the pinch lever assembly is correctly mounted on the groove of the cam gear.)
d) Confirm that the clearance between the drive lever and the cam gear is approx. 2 mm. (Confirm that the drive lever is correctly mounted on the groove of the cam gear.)
e) Confirm that the ▲ mark on the rotor of the cam switch aligns with the A mark on the motor bracket.
5. After completion above steps a) to e), mount the loading drive assembly. Push four claws to the motor bracket in the order of (d) > (c) > (b) > (a) and push the portion (A) (No. 8 guide cap) into the motor bracket.
6. Confirm that the ▲ mark on the rotor of the cam switch aligns with that on the bracket when the hole b) on the cam gear aligns with the hole on the mechanical deck. If the alignment of the A marks cannot be confirmed, remove loading drive assembly once again and reinstall after confirming the above steps a) to e).
7. Mount two flat cables.
8. Mount the F/L ground plate and the head cleaner assembly.



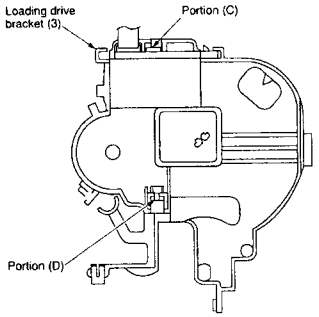


Loading drive assembly bottom side

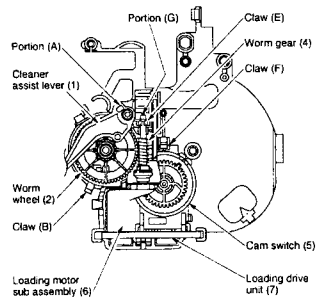
Fig. 6-29-3

1-6-30. Loading Motor Sub Assembly, Cam Switch and Loading Drive Unit Replacement

1. Remove the loading drive assembly. (Refer to item "1-6-29. Loading Drive Assembly Replacement".)
2. Remove the cleaner assist lever (1) from the claw (A).
3. After removing the cleaner assist lever (1), the worm wheel can be also removed upward.
4. Insert a slot-type screwdriver into the portion (C) of the loading drive bracket (3) and push the loading motor 2 - 3 mm lower. And push the tip of worm gear from the portion (D) of the loading bracket (3), then remove the worm gear (4) from the claw (E).
5. Remove the cam switch (5) from the claw (F) on the loading drive bracket (3) and pull out the loading drive unit (7) and the worm gear (4) simultaneously.
6. Replace the loading drive unit (7). When mounting the PC boards of the cam switch (5) and the loading drive unit (7), take care that no clearance is allowed.
7. Insert the loading drive unit (7) and the worm gear (4) into the loading drive bracket (3).
8. Push the tip (G) of the worm gear (4) into the claw (B) on the loading motor bracket. In this process, take care not to bend the tip of the worm gear with strong pressure.
9. Push the cam switch (5) into the claw (F) on the loading motor bracket.
10. Mount the parts in the reverse order of removal.



Loading drive assembly (Top Side)



Loading drive assembly (Bottom side)

Fig. 6-30-1

1-6-31.Cam Gear Replacement
1. Remove the loading drive assembly. (Refer to item "1-6-29. Loading Drive Assembly Replacement".)
2. Remove the cam slider. (Refer to item "1-6-41. Cam Slider Replacement".)
3. Remove the drive lever. (Refer to item "1-6-40. Drive Lever Replacement".)
4. Remove the pinch roller assembly. (Refer to item "1-6-21. Pinch Assembly Replacement".)
5. Remove the cam gear.
6. Apply grease on a new cam gear on the shaded portion as shown in Fig. 6-31-1 and the shaft of the main base.

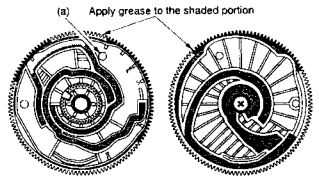


Fig. 6-31-1

7. Make the S. T slider to the slot out condition.
8. Push the cam lever (1) and the pin (2) (loading slider) in the direction shown by the arrows (A) and (B).
9. Mount the cam gear at the angle which the small hole (a) on the cam gear aligns with the hole on the mechanical deck. (Refer to Fig. 6-31-1.)

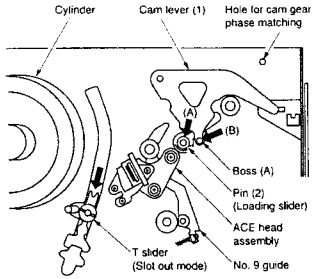


Fig. 6-31-2

10. Mount the parts in the reverse order of removal.

1-6-32. S Reel Table Assembly and Washer 2 Replacement

1. Remove the top bracket and the cassette holder assembly. (Refer to item "1-6-1. Top Bracket Replacement and "1-6-2. Cassette Holder Assembly Replacement".)
2. Remove the drive arm assembly. (Refer to item "1-6-5. Drive Arm Assembly Replacement".)
3. Remove the cam slider. (Refer to item "1-6-41. Cam Slider Replacement".)
4. Remove the S soft brake and S main brake assembly. (Refer to item "1-6-38. S Soft Brake Replacement and 1-6-37. S Main Brake Assembly Replacement".)
5. Remove the tension lever assembly. (Refer to item "1-6-23. Tension Lever Assembly Replacement".)
6. Remove the S reel table assembly (1) pulling it out upward.
7. Remove the washer 2 (2).
8. After cleaning the reel shaft (3) with a cleaning kit, insert a new washer 2 (2) to the reel shaft (3) and apply a drop of oil to the shaded portions (two locations) on the reel shaft (3).
9. After replacing, mount the parts in the reverse order of removal.
10. Confirm the reel torque using a torque cassette.

Note:
• The washer 2 (2) can use repeatedly.

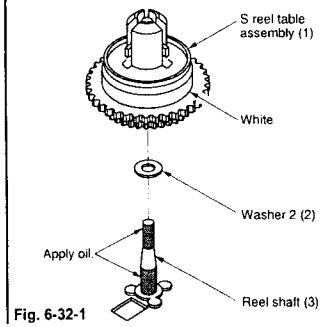


Fig. 6-32-1

1-6-33. T Reel Table Assembly and Washer 2 Replacement

1. Remove the top bracket and the cassette holder assembly. (Refer to item "1-6-1. Top Bracket Replacement and 1-6-2. Cassette Holder Assembly Replacement".)
2. Remove the drive arm assembly. (Refer to item "1-6-5. Drive Arm Assembly Replacement".)
3. Remove the T soft brake and T main brake assembly (Refer to item "I-6-41. Cam Slider Replacement".)
4. Remove the T reel table assembly (1) pulling it out upward.
5. Remove the washer 2 (2).
6. After cleaning the reel shaft (3) with a cleaning kit, insert a new washer 2 (2) to the reel shaft (3) and apply a drop of oil to the shaded portions (two locations) on the reel shaft (3).
7. After replacing, mount the parts in the reverse order of removal.
8. Confirm the reel torque using a torque cassette.

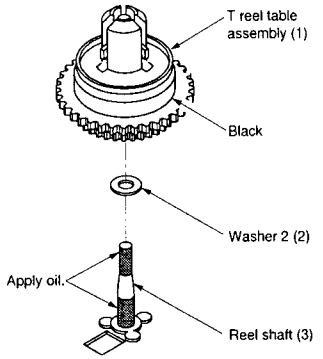


Fig. 6-33-1

Note:
• Washer 2 (2) can use repeatedly.

1-6-34. Idle Arm Assembly Replacement (Center Gear Pulley, Idle Kick Lever Idle up/down Lever)

1. Remove the mechanical deck from the main PC board.
2. Remove the stop ring (1) turning over the mechanical deck.
3. Remove the center gear pulley (2) lifting it upward.
4. Remove the claw (A) on the idle kick lever (3) moving and pulling it upward.
5. Remove the slit washer (4).
6. Remove the idle up/down lever (5) and the idle arm (6) simultaneously from two claws (B) on the mechanical deck.
7. After cleaning the center gear post (7) using a cleaning kit, apply a few drops of oil to the shaded portion on the center gear post.
8. Mount the parts in the reverse order of removal.

Note:
• Stop ring (1) is impossible to use again.
• When mounting the parts, take care of the notice shown in Fig. 6-34-2.

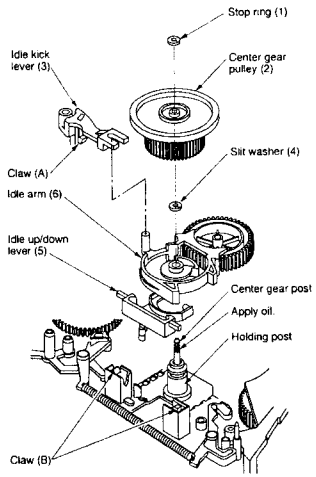


Fig. 6-34-1

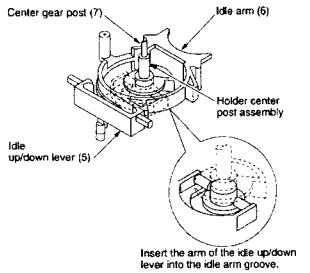

Center gear post (7)
Idle arm (6)
Holder center post assembly
Idle up/down lever (5)
Insert the arm of the idle up/down lever into the idle arm groove.

Fig. 6-34-2

1-6-35. Holder Center Post Assembly Replacement

1. Turn over the mechanical deck and remove the center gear pulley and the idle arm. (Refer to item "1-6-34. Idle Arm Assembly Replacement".)
2. Turn over the mechanical deck and remove the top bracket and the cassette holder assembly. (Refer to item "1-6-1. Top Bracket Assembly Replacement and

1-6-2. Cassette Holder Assembly Replacement".)

3. Remove the drive arm assembly. (Refer to item "1-6-5. Drive Arm Assembly Replacement".)
4. After removing two screws (1), replace the holder center post assembly (2).
5. After replacing, mount the parts in the reverse order of removal.

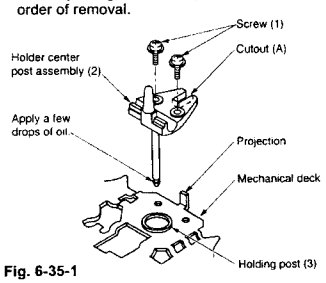


Fig. 6-35-1

Mechanical Adjustments Cont'd

Note:
- When mounting, push the cutout (A) on the holder center post assembly (2) aligning with the projection on the mechanical deck.
- Screw tightening torque is 294 - 392 mN•m (3 - 4 kg•cm).
- Before mounting the center gear pulley, apply a few drops of oil. (Refer to **Fig. 6-34-1**.)

1-6-36. REC Inhibiting Lever Replacement
1. Remove the top bracket. (Refer to item "1-6-1. Top Bracket Replacement".)
2. Remove the cassette holder assembly. (Refer to item "1-6-2. Cassette Holder Assembly Replacement".)
3. Remove the cam slider. (Refer to item "1-6-41. Cam Slider Replacement".)
4. Remove the tension spring (2).
5. Undo the claw (A) on the S soft brake (1) sliding and lifting it upward.
6. Remove the projection (B) on the REC inhibiting lever (3) sliding in the direction shown by the arrow and lifting it upward.
7. After replacing the REC inhibiting lever (3), mount the parts in the reverse order of removal.

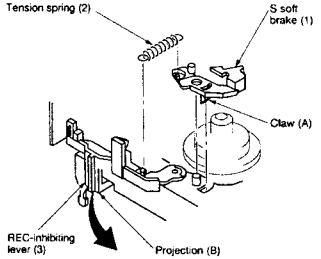


Fig. 6-36-1

1-6-37. S, T Main Brake Assembly Replacement
1. Remove the mechanical deck from the main PC board and turn the mechanical deck upside down.
2. When replacing the T main brake assembly (2), first remove the idle kick lever (3). (Refer to item "1-6-34. Idle Arm Assembly Replacement".)
3. Remove the tension spring (4).
4. Remove the claws on the S, T main brakes (1), (2) from the mechanical deck lifting the S, T main brakes (1), (2) upward.
5. After replacing the S, T Main brake assemblies (1), (2), mount the parts in the reverse order of removal.

Note:
- When mounting the S, T main brake assemblies (1), (2) take care that both ends of the S, T main brakes (1), (2), do not touch the gear of the reel table.

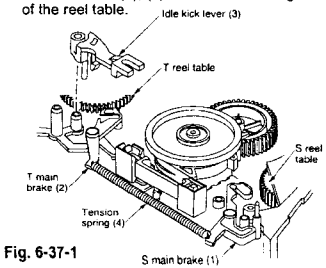


Fig. 6-37-1

1-6-38. S Soft Brake Replacement
1. Remove the cam slider. (Refer to item "1-6-41. Cam Slider Replacement.")
2. Remove the drive arm assembly. (Refer to item "1-6-5. Drive Arm Assembly Replacement".)
3. Remove the S soft brake spring (1).
4. Remove the S soft brake (2) after removing the claw (A) on the S soft brake from the mechanical deck.

Note:
- When mounting the S soft brake spring (1), take care not to deform the hook (B).
- When mounting the S soft brake (2), take care of the band brake (3).

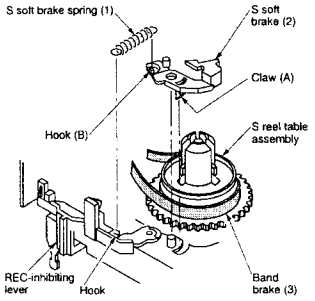


Fig. 6-38-1

1-6-39. T Soft Brake Replacement
1. Remove the T soft brake spring (I).
2. Remove the claw (A) on the T soft brake (2) from the mechanical deck and remove the T soft brake (2).
3. After replacing the T soft brake (2), mount the parts in the reverse order of removal.

Note:
- When mounting the T soft brake spring (1), take care not to deform the hook (B).
- Take care not to touch the surface (C) on the brake pad.

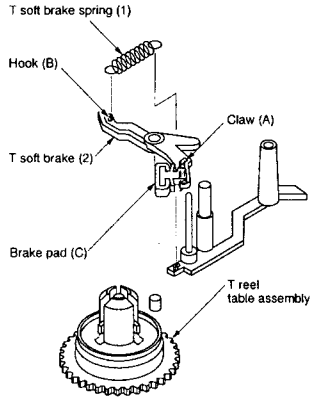


Fig. 6-39-1

1-6-40. Drive Lever Replacement

1. Remove the top bracket. (Refer to item "1-6-1. Top Bracket Replacement".)
2. Remove the cassette holder assembly. (Refer to item "1-6-2. Cassette Holder Assembly Replacement".)
3. Remove the drive arm assembly. (Refer to item "1-6-5. Drive Arm Assembly Replacement".)
4. Remove the cam slider. (Refer to item "1-6-41. Cam Slider Replacement".)
5. Remove the Loading Drive Assembly. (Refer to item "1-6-29. Loading Drive Assembly Replacement.")
6. Remove the drive lever (I).
7. After replacing the drive lever (I), mount the parts in the reverse order of removal.

Note:
- Be sure to align the phase of the cam gear (2). (Refer to item "1-6-41. Cam Slider Replacement".)
- Mount the drive lever (1) so that it is positioned between the mark (A) on the mechanical deck and the outsert (B).
- Apply grease to the surface between the mark (C) on the mechanical deck and the drive lever shaft (D).

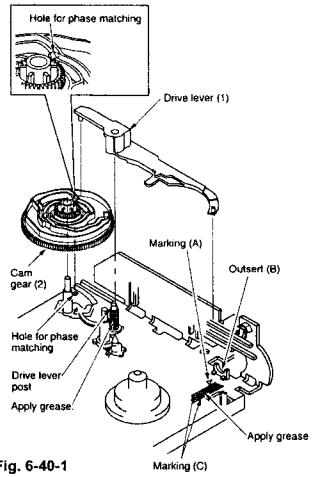


Fig. 6-40-1

1-6-41. Cam Slider Replacement
1. Remove the top bracket and the cassette holder assembly. (Refer to item "1-6-1. Top Bracket Replacement and 1-6-2. Cassette Holder Assembly Replacement".)
2. Remove the tension spring (1).
3. Turn the hook lever assembly (2) counterclockwise and turn the S soft brake (3) counterclockwise.
4. Move the cam slider (4) to the right and align the projection (A) on the mechanical deck and the cutout portion (B) on the cam slider (4).
5. Remove the claw (C) on the cam slider (4) and remove the cam slider (4) lifting the cam slider (4) upward.

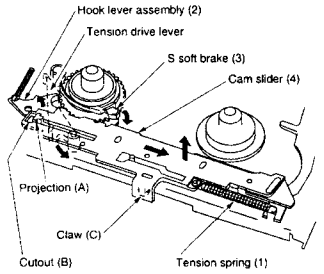


Fig. 6-41-1

6. Apply grease on the shaded portion of a new slider for the replacement.
7. Mount the parts in the reverse order of removal. After inserting the cam slider, slide it to the left direction till it stops. (Fig. 6-26-2 shows this condition.)

Note:
- When mounting the cam slider (4), slide the tension drive lever in the direction shown by the arrow (counterclockwise).
- After completion of the replacement, confirm that the cam slider (4) can slide to left and right directions smoothly.

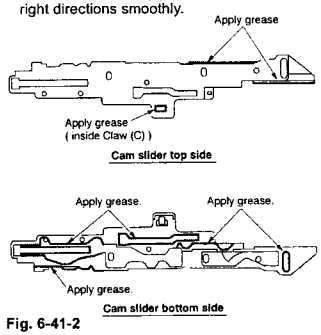


Fig. 6-41-2

1-6-42. Idle Centering Lever Replacement

1. Remove the cam slider. (Refer to item "1-6-41. Cam Slider Replacement".)
2. Remove the claw on the idle centering lever (1) and remove the idle centering lever (1) lifting it upward.
3. After replacing the idle centering lever (1), mount the part in the reverse order of removal.

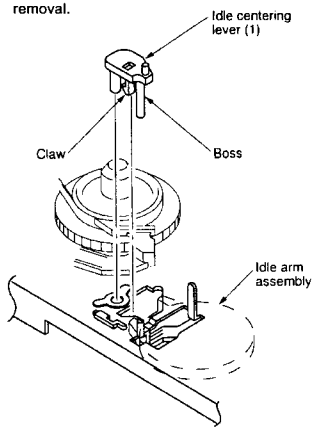


Fig. 6-42-1

1-6-43. Capstan Motor Replacement
1. Remove the reel belt (1).
2. Remove one screw (2) from the bottom of the mechanical deck, and remove the PC board (3).

Note:
- Take care not to misuse the screw with others.

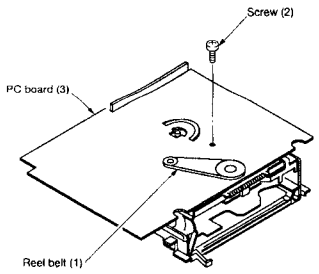


Fig. 6-43-1

3. Remove the capstan motor (4) after removing three screws (5).

Note:
- Take care not to drop the capstan motor.

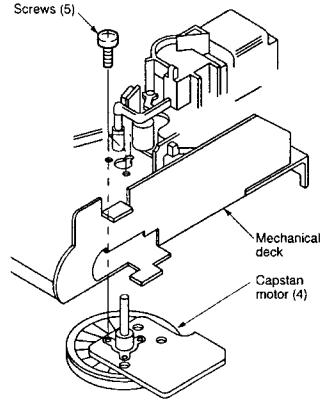


Fig. 6-43-2

4. Take care not to damage and scratch the motor itself, and mount the capstan motor (4) fitting the hole (A) on the mechanical deck and the hole (B) on the capstan motor (4).

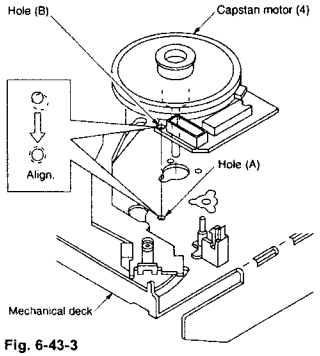


Fig. 6-43-3

5. Mount the capstan motor (4) with three screws (5) viewing from the top side of the mechanical deck.

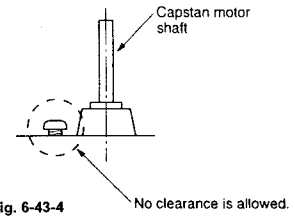


Fig. 6-43-4

Note:
- Do not use once-removed screws again.
- Take care that no clearance is allowed when securing three screws.

6. After replacement, mount the parts in the reverse order of removal.

Note:
- In this case, take care not to twist the reel belt and stick the grease or etc. on it.

7. After replacing, perform the adjustment according to the tape transport adjustment procedures.

1-6-44. S-VHS Switch Assembly Replacement (S-VHS model only)

1. Slide the cassette holder assembly (I) until the screw (2) can be seen from the hole on the top bracket (3).
2. Insert a screwdriver from the hole provided on the top bracket (3) and secure the screw (2).
3. Remove the S-VHS switch assembly (4) upward.
4. After completion of the replacement, mount the parts in the reverse order of removal.

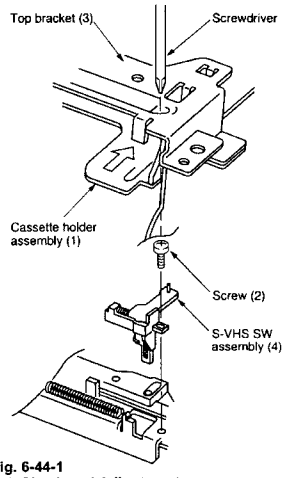


Fig. 6-44-1

1-7. Check and Adjustment

1-7-1. Check of Tension Pole Position
1. Turn the worm wheel counterclockwise after removing the cassette holder assembly on the front loading mechanism, and set the cam gear at playback position.
2. Turn the S reel table assembly (1) clockwise slowly.
3. Adjust the adjuster (3) counterclockwise from the position shown in Fig. 6-23-1 so that the clearance between the left end of the tension lever assembly (2) and the left side of the mechanical deck becomes 7.5 ±1mm.

Mechanical Adjustments Cont'd

Note:
- There is a long mark at the position of 7.5 mm from the round surface of the mechanical deck. Make sure the position of the mark when adjusting.

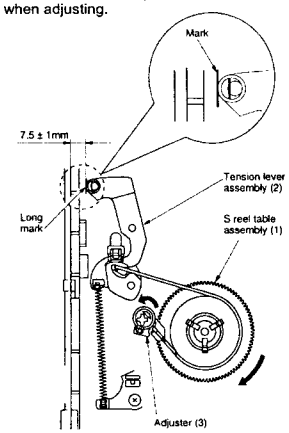


Fig. 7-1-1

1-7-2. Reel Torque Check
(1) Reel torque

1. REVIEW mode (supply side)
   Poor torque may not wind the tape. On the other hand, excessive torque will cause damage to the tape during REVIEW mode.
2. Record/Playback mode (take-up side)
   Too little torque does not rewind the tape to the end. If too large torque, the tape may be stretched by excessive tension.
3. Inspection
   Rewind the torque cassette to the end, then check the torque values shown below:

Review	15.95 ± 3.65 mN•m (162.5 ± 37.5 g•cm)
Record/Playback	6.85 ± 2.45 mN•m (70 ± 25 g•cm)

For checking method, refer to the following item (2).

(2) Reel torque and back tension check

1. First, record a TV broadcast program on the entire torque cassette tape (KT-300NR) in the SP mode.
2. Load the torque cassette tape (KT-300NR) in the VTR and feed it forward until the end of the tape, before proceeding with measurement.
3. Set the VTR to the REVIEW mode and feed the tape for about l 5s, and then make sure the take-up torque described above is obtained while observing the left torque meter.
4. After completion of step 3), feed forward to tape start position and set the VTR to the PLAY mode and feed the tape for about 30s. Read the right torque meter and check the torque described above is obtained.
5. If the review torque and playback torque are out of limit, replace the clutch assembly.
6. When the S reel table assembly, the T reel table assembly and the idle arm assembly are replaced, perform the reel torque check.

< Precautions for Use of Torque Cassette (KT-300NR) >

1. Before loading a torque cassette in a VTR, always remove tape slack. The tape slack can be removed by rotating the reel to its take-up direction. (The tape tends to slack when there is no reel brake actions.)
2. When the torque cassette is loaded, confirm followings:
   - Make sure the tape does not ride up or over the No. 8 cap. If it does, do not eject the tape but return the tape to its correct position, taking care not to damage the tape.
   - Make sure the tape is not slackened. If slackened, operate the VTR in FF or REW mode and then stop the tape. Then make sure the tape is not slackened again.
   - After above confirmation, proceed to the reel torque adjustment and confirmation.
3. Caution for removal of torque cassette
   - When removing the torque cassette from the VTR, set the VTR to the STOP mode and wait for several seconds. Then, make sure the tape is not slackened. Push the EJECT button to remove the cassette.
4. If the previous precautions 1), 2) and 3) are not performed properly, the tape may be damaged and correct measurements can not be performed.
5. Do not use worn out or damaged tape, if used they may damage video heads on the cylinder. In such a case always replace the tape with a new one. The replacement tape is of E- 180, 10 m in length.

1-7-3. Tape Transport System

The tape transport system has been precisely adjusted in the factory, so no check and alignment are necessary except the followings:

- Noises observed on the screen
- Tape damage
- Parts, shown in the adjustment procedures for the tape transport system were replaced.

Electrical signal output terminal required for adjustment differs depending upon the models. Refer to the test point location in the Electrical Adjustment Section.

1) Location of tape transport adjustment <Adjustment reference>

Lower flange height of No. 8 guide is used as the basic reference for the transport adjustment. To keep height of the No. 8 guide, do not apply excessive force onto the main base to prevent the main base from deformation. Rectangles shown in Figs. 7-3-1, 7-3-2 show the adjusting locations.

2) Tape Transport System Adjustment Flow Chart (See Next Page).

3) Tape transport system adjustment <Pre-adjustment>

When the part(s) listed in **Table 7-3-1** is replaced, perform required adjustments by referring to procedures for the tape transport system. When the part(s) listed in **Table 7-3-1** is replaced, the tape path may be changed and may damage alignment tape. To prevent this, first run a E-240 tape and make sure excessive tape wrinkle does not occur at each tape guide.

1. If tape wrinkle is observed at the S, T guide rollers, turn the S, T guide rollers until wrinkle disappears.
2. If tape wrinkle is observed at the No. 8 guide, perform the tilt adjustment of the ACE head.

Table 7-3-1

Parts replacement	Adjustment procedure
• Cylinder assembly • S, T sliders • ACE head • Pinch lever assembly • Capstan motor • No. 9 guide lever assembly	From item 1)
• Upper cylinder	From item 2)
• S, T guide rollers • Tension lever assembly	From item 3)
• FE head • Reel clutch assembly • S, T reel tables	From item 4)

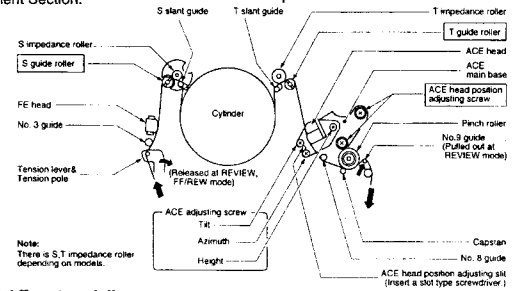


Fig. 7-3-1 Tape travel diagram

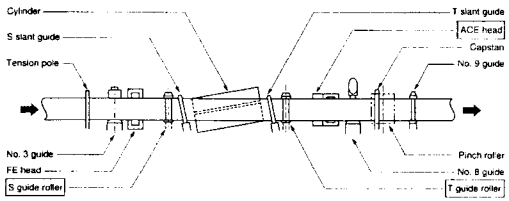


Fig. 7-3-2 Location of tape transport adjustment

<Adjustment procedures>
1) ACE head assembly coarse adjustment

a. Audio head height adjustment
1. Play back the tape recorded in the SP mode. Observe the surface of the ACE head.
2. Turn the ACE height adjusting screw so that upper tape edge matches to the upper edge of the audio head core.

b. ACE head tilt adjustment
1. Play back the tape recorded in the SP mode and observe running condition of the tape at the lower flange of No.8 guide.
2. Turn the ACE tilt adjusting screw until tape wrinkle is caused at the lower flange of No. 8 guide as shown in Fig. 7-3-4 (A).
3. Turn the ACE tilt adjusting screw counterclockwise until the tape travels along the lower flange as shown in Fig. 7-3-4 (B).

c. Audio head azimuth adjustment
1. Play back the 7 kHz audio signal on the alignment tape in the SP mode.
2. Connect a millivoltmeter or oscilloscope to the audio line output terminal.
3. Turn the ACE azimuth adjusting screw to obtain maximum audio output.

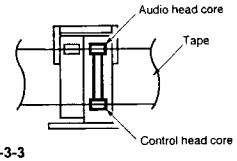


Fig. 7-3-3

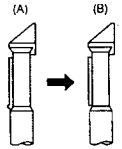


Fig. 7-3-4

No. 8 guide rough adjustment

d. ACE head position adjustment
1. Play back the 3 MHz video envelope signal in the alignment tape in the SP mode. Loosen the ACE head position securing screw.
2. Insert a slot-type screwdriver into the ACE head position adjusting slit on the ACE main base and adjust the ACE main base so that the video envelope reaches a peak level at the tracking centerposition when the channel (tracking) up/down buttons of VTR are pressed simultaneously.

2) Playback phase adjustment
1. Perform the adjustment according to the methods stated in the electrical adjustment (servo circuit).

3) Linearity adjustment
1. Play back the LP mode white video signal on the alignment tape.

Note:

- For models SP mode only, use the 3 MHz (A ch) video siganl in the SP mode.
2. Trigger the scope with the switching pulse to issue the envelope signal output.
3. Make sure the video envelope waveform (in its maximum output) meets the specification shown in Fig. 7-3-5. Again make sure the same by playing back the SP mode 3 MHz video signal on the alignment tape. If not satisfied, adjust as follows:

Note:

a = maximum output of the video RF envelope
b = minimum output of the video RF envelope at the entrance side
c = minimum output of the video RF envelope at the center point of cylinder
d = minimum output of the video RF envelop at the exit side of cylinder

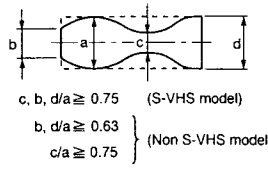


Fig. 7-3-5

4. If the (A) section in **Fig. 7-3-6** does not meet the specifications, adjust the S guide roller in up or down direction.
5. If the (B) section in **Fig. 7-3-6** does not meet the specifications, adjust T guide roller in up or down direction.

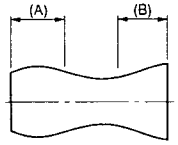


Fig. 7-3-6

6. After completion of the adjustment(s), push the channel (tracking) up/down button and make sure video envelope variations are almost flat. Next, play back the 3 MHz SP mode video signal on the alignment tape and makes the video RF envelope variations are also flat when chanhel (tracking) UP/DOWN buttons is pushed.
7. If the envelope varies like NG figures as shown in **Fig. 7-3-7**, perform the adjustment again. Smooth secondary curves are allowable level.

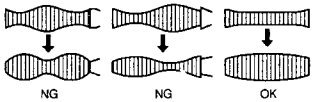


Fig. 7-3-7 Abnormal waveform variation

4) ACE head assembly fine adjustment

a. ACE head height fine adjustment

1. Play back the stereophonic alternative recording 300 - 500 Hz audio signal on the alignment tape.
2. Adjust the ACE height adjusting screw so that the signal envelope is obtained almost flat.

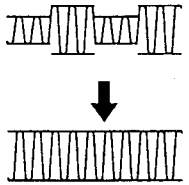


Fig. 7-3-8

Note:
- If there is no alignment tape (ST-C6, ST-C7), do not perform this item "a. ACE head height fine adjustment", and perform the process of the note in item "e. Audio head height check" described later.

b. ACE tilt adjustment

1. Observe the lower flange of No. 8 guide. If any wrinkle is observed, turn the ACE tilt adjusting screw counterclockwise until the wrinkle disappears.
2. If a gap is observed between the lower flange of No. 8 guide and the lower edge of tape, turn the ACE tilt adjusting screw clockwise until the tape travels along the lower flange.

Note:
- This adjustment is performed easily in SP mode playback, double speed playback mode or CUE mode.

c. Audio head height check
1. Play back the stereophonic alternative recorded 300 - 500 Hz audio signal as described in the step 4)-a, and check if the audio envelope is flat. If not, repeat the adjustment described in step 4)-a again.

d. Audio azimuth adjustment
1. Play back the 400 Hz, 7 kHz audio signal on the alignment tape.
2. Turn the ACE azimuth adjusting screw until the maximum audio output is obtained.

e. Audio head hight check
1. Play back the alignment tape desribed in step 4)-a and check if the audio envelope is flat. If not, repeat the adjustment described in step 4)-a.

Note:
- If there is no alignment tape (ST-C6, ST-C7), perform the audio height alignment using the current alignment tape at this adjustment step.

1. Playback the 400 Hz audio signal (SP mode) on the alignment tape.
2. Turn each three alignment screw of the ACE head to the same direction in 45 degrees steps evenly so that the audio output level becomes maximum.
3. Perform the confirmation and adjustment for the tilt and the azimuth again.

f. ACE head postion adjustment
1. Play back the 3 MHz (LP mode) on the alignment tape.
2. Push the channel (tracking) up/down buttons simultaneously and reset the tracking at its center position.
3. Trigger the oscilloscope with the video switching pulse and observe the video envelope waveform.
4. Slide the ACE main base until the maximum envelope output is obtained as described in ACE head position coarse adjustment.
5. Play back the 3 MHz video signal (SP mode) on the alignment tape.
6. Make sure the envelope output is maximum when the tracking control is placed at its center position. If no envelope output is obtained with the tracking control set to the center position, again adjust it for maximum envelope output in SP and LP modes. When envelope output is maximum in the LP mode at the tracking center, difference with the case in the SP mode is within 3 ins.
7. Tighten the ACE head position fixing screw and secure the ACE main base.

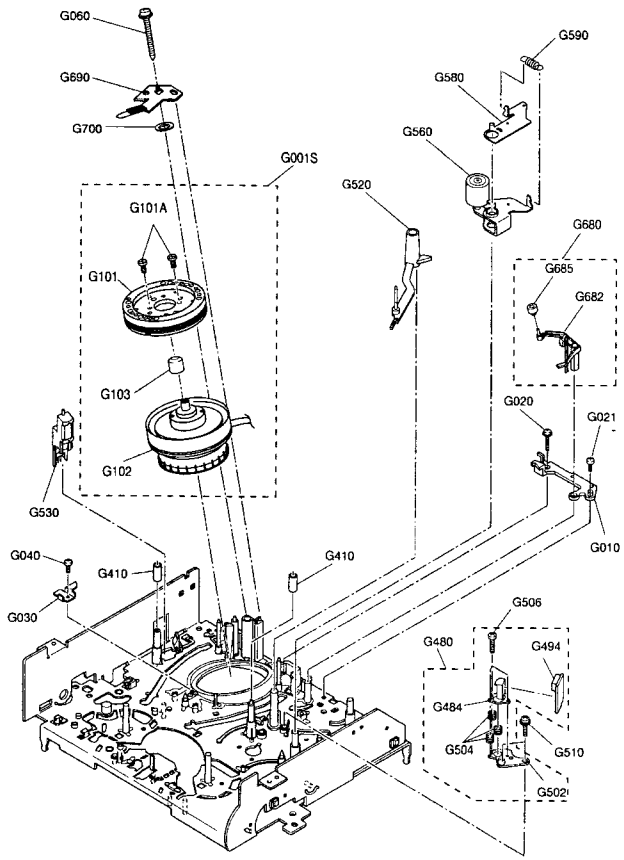
Continues after next page...

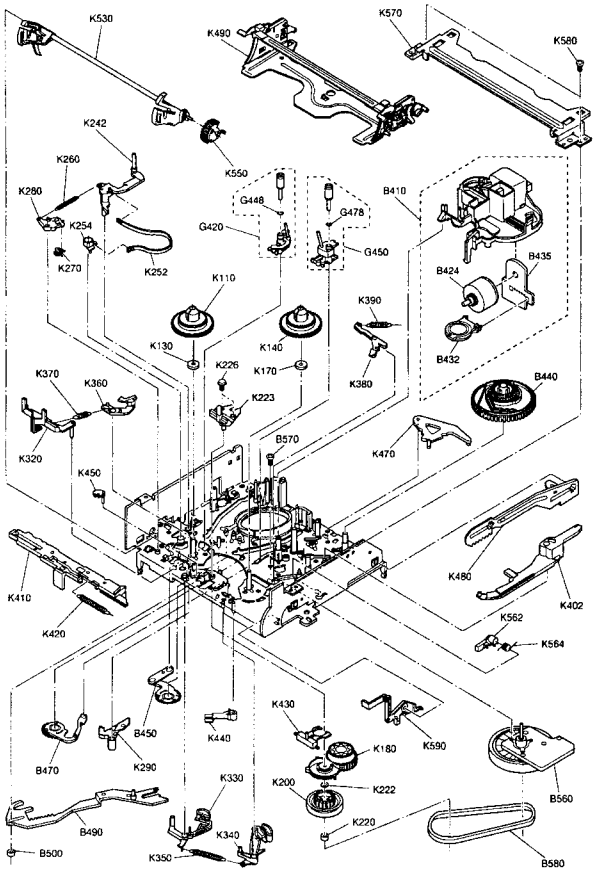
AV-View Limited

Mechanical Parts

Item	Part No.	Description
0001C	70061667	Owners Manual English (V-856 B)
0010C	70012574	Remote Control Unit
0013C	70031442	Cable
0014C	70012604	Power Cord (V-856 B)
0155F	70051862	Cassette Door
0170F	70051372	Spring
0250	70051879	Front Panel (V-856 B)
0270	70051852	Knob
0280	70051853	Knob
0300	70869451	Insulator (Right)
0310	70869452	Insulator (Left)
0350	70051766	Bottom Plate
0400	70824403	Top Cover
0600	70061764	Packing (Bottom)
0650	70061765	Packing (Top)
0700	70917939	Case
B410	70031394	Loading Drive Assy
B424	70031396	Loading Motor Sub Assy
B432	70031401	Cam Switch
B435	70031402	Loading Drive Unit
B440	70051147	Cam Gear
B450	70031404	S Loading Assy
B470	70031408	T Loading Assy
B490	70031412	Loading Slider Assy
B560	70031744	Capstan Motor Assy
B570	70070028	Screw, 2. 6x6mm
B580	70031442	Reel Belt
G001S	70031739	Cylinder Assy
G010	70031444	Plate (Cylinder)
G020	70031643	Screw 2. 6x5mm
G021	70031644	Screw 2. 6x5mm
G030	70031445	Plate (Cylinder)
G040	70031644	Screw 2. 6x5mm
G060	70031449	Screw
G101	70031695	Upper Cylinder Assy
G101A	70031521	Screw
G102	70031741	Lower Cylinder Assy
G103	70031683	Ground Cap Assy
G181	70391422	Screw 2x4mm
G410	70031348	Guide Sleeve
G420	70031349	S Slider Assy
G448	70031505	0 Ring
G450	70031360	T Slider Assy
G480	70031512	ACE Head Assy
G484	70031511	ACE Sub Base Assy
G504	70033508	Spring
G520	70031370	No. 9 Guide Lever Assy
G530	70031443	FE Head
G560	70031384	Pinch Lever Assy
G580	70031390	Pinch Drive Assy
G590	70031392	Spring
G680	70031493	Cleaner Lever Assy
G690	70031540	Ground Brush
K110	70031328	S Reel Assy
K130	70031334	Washer
K140	70031335	T Reel Assy
K170	70031334	Washer
K180	70031339	Idle Arm Assy
K200	70031345	Center Gear Pully
K220	70031503	Washer
K222	70031527	Washer
K223	70031454	Center Post Assy
K242	70031374	Tension Lever Sub Assy
K252	70031376	Band Brake Sub Assy
K254	70031377	Band Holder
K260	70031660	Spring
K270	70031379	Hook Lever
K280	70031380	Hook Lever
K290	70031381	Tension Drive Lever
K320	70031466	Rec Inhibit Lever
K330	70031420	S Main Brake Assy
K340	70031421	T Main Brake Assy
K350	70031422	Spring
K360	70031469	S Soft Brake Lever
K370	70031423	Spring
K380	70031424	T Soft Brake Assy
K390	70031426	Spring
K402	70031471	Drive Lever
K410	70031427	Cam Slider
K420	70031428	Spring
K430	70031472	Idle Up Down Lever
K440	70031473	Idle Kick Lever
K450	70031476	Idle Centering Lever
K470	70031477	Cam Lever
K480	70031430	FL Drive Slider
K490	70031431	Cassette Holder Assy
K530	70031415	Drive Arm Assy
K550	70051110	Drive Lever Gear
K562	70031482	Arm Brake Lever
K164	70031440	Spring
K570	70031441	Top Bracket
K590	70031483	Door Open Lever
U501A	70070070	Screw

Deck Exploded Parts View





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Tape Transport System Adjustment Flow Chart

Cylinder assembly replacement
S, T slider replacement
ACE head assembly replacement
Capstan motor assembly replacement
Pinch lever assembly replacement
Cylinder motor replacement

Upper cylinder assembly replacement

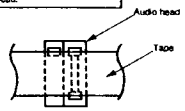
S, T guide roller replacement
Tension lever assembly replacement
Impedance roller replacement
FE head replacement

Reel clutch assembly replacement
Reel table replacement
Taper nut replacement

1) ACE head assembly coarse adjustment

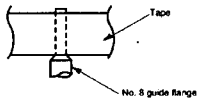
1. AUDIO HEAD HEIGHT ADJUSTMENT (AUDIO HEIGHT ADJUSTING SCREW)

Playback the tape recorded in SP mode. Adjust position of the upper flange of tape and that of the audio head.



2. AUDIO HEAD TILT ADJUSTMENT (TILT ADJUSTING SCREW)

Playback the tape in SP mode continuously. Adjust Audio head tilt screw so that tape transports along lower flange of No. 8 guide.



3. AUDIO AZIMUTH ADJUSTMENT (AZIMUTH ADJUSTING SCREW)

Playback 7 kHz audio signal on alignment tape and adjust for max. output.

4. ACE HEAD POSITION ADJUSTMENT

Playback video envelope signal 3 MHz (A ch) on alignment tape in SP mode. Set tracking control at its center. Adjust ACE main base to obtain max. output.

2) Playback phase adjustment

Adjust as described in the Electrical Adjustment Section (Servo circuit.) in each service data.

3) Linearity adjustment (S, T guide roller)

(Note 1)

1. MAXIMUM ENVELOPE OUTPUT

Playback the 3 MHz video signal on the alignment tape.
Trigger scope with switching pulse.
Adjust tracking control for maximum envelope output by pushing channel (tracking) up/down buttons.

2. ENTRANCE SIDE ENVELOPE ADJUSTMENT

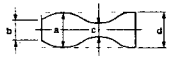
Rotate S guide roller until entrance side envelope becomes as flat as possible.

3. EXIT SIDE ENVELOPE ADJUSTMENT

Rotate T guide roller until exit side envelope becomes as flat as possible.

4. LINEARITY CHECK

Press the channel (tracking) up/down buttons alternately, make sure envelope increases or decreases with flat response kept.



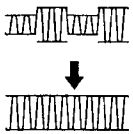
c/a ≥ 0.75
b, d/a ≥ 0.63 (S-VHS model)
b, c, d/a ≥ 0.75 (Non S-VHS model)

(Note 1) For the linearity adjustment, make sure adjusted value should be checked with 3 MHz (SP) video signal after completion of specified adjustments using 3 MHz (LP) video signal in alignment tape.

4) ACE head assembly fine adjustment

1. ACE HEAD HEIGHT FINE ADJUSTMENT

Playback stereophonic alternative recording signal (300-500Hz) on alignment tape.
Turn the Audio height adjusting screw until audio envelope signal becomes as flat as possible.



2. AUDIO HEAD TILT FINE ADJUSTMENT

Playback alignment tape in CUE or double speed mode.
Adjust Audio head tilt until tape runs along lower flange of No. 8 guide.

3. ACE HEAD HEIGHT FINE ADJUSTMENT

Playback alignment tape as described in step 1, make sure audio envelope signal becomes as flat as possible

NG

OK

4. AUDIO HEAD AZIMUTH FINE ADJUSTMENT

Playback 7 kHz audio signal on alignment tape.
Turn the azimuth adjusting screw to obtain maximum output.

5. AUDIO HEAD HEIGHT CHECK

Repeat same step as step 3.

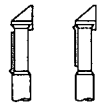
NG

OK

5) No. 9 guide lever check

1. TAPE WRINKLE CHECK

- Playback E-240 tape in Review mode.
- Confirm the portion of upper/lower flange on No.8 guide.



2. NO. 9 GUIDE

If tape travels out of upper/lower flange as shown above, pinch lever or capstan motor or No.9 guide lever is defective.
Replace the defective part(s).

6. ACE HEAD POSITION

- Set tracking at its center position pushing channel (tracking) up/down buttons simultaneously.
- Playback 3 MHz video signal (LP mode) on the alignment tape. Slide ACE main base to obtain max. envelope.
- Playback 3 MHz (A ch) video signal (LP mode) on the alignment tape. Confirm that difference from tracking center is within 3 ms when maximum envelope is obtained.
- If not, readjust in LP mode.

6) Check for transitional operation

1. Playback 3 MHz video signal (LP mode) in alignment tape and set review mode.

2. Change mode from review to play and check entrance side envelope rises within 3s.
Check entrance side envelope rises within 3s, when mode is changed from slot-in to play.

OK

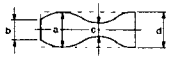
NG

3. Adjust S guide roller to readjust linearity.

4. Check step 2 and 3 if no good, replace S slider assy or tension lever.

7) Recorded & reproduced envelope check

- Records signals in SP & LP modes, using E-180, E-240 tape and playback them to check envelopes.



c/a ≥ 0.75
b, d/a ≥ 0.63 (Non S-VHS model)
b, c, d/a ≥ 0.75 (S-VHS model)

8) Tape damage check

- Run E-240 tape in each mode and check there is no damage at each guide.

Playback mode
Review
Frame advance mode

9) Checks for Hi-Fi models only

AFM envelope output max. point check

Playback 3 MHz video signal, 400 Hz AFM signal in alignment tape ST-C7 in SP mode.

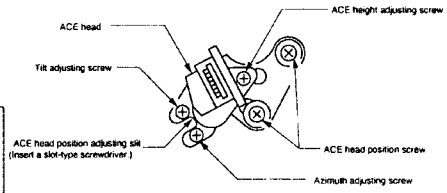
Check video envelope max. point (A ch).

Check control pulse phase difference is within ±3 ms from that point to AFM envelope max. point.

Playback mode:
- Guide roller section damage
  Back to step 3) linearity adjustment. (or Slider assembly replacement)
- Damage at No.8 guide brush
  Back to step 1) ACE head assembly coarse adjustment. (or Pinch lever replacement)
- Damage at No.1 guide lower flange
  Back to step 6) check for transitional operation. (or Tension lever replacement)

Review:
- Damage at No.8 guide flange
  Back to step 5) No.9 guide lever check or 1) ACE head assembly coarse adjustment (Pinch lever, No.9 lever, Capstan motor replacement)
- Damage at guide roller section
  Back to step 3) linearity adjustment (or Slider assembly replacement)

Frame advance mode:
- Damage at No.8 guide flange
  Back to step 3) linearity adjustment.


ACE head
Tilt adjusting screw
ACE head position adjusting slit (Insert a slot-type screwdriver.)
ACE height adjusting screw
ACE head position screw
Azimuth adjusting screw

* VTR applied SP mode only. Use 3 MHz (A ch) video signal (SP mode) instead of 3 MHz video signal (LP mode).

Electrical Adjustments Cont'd

g. After completion of ACE head fine adjustment, apply screw lock to two screws (tilt, azimuth adjusting screws) in front of the ACE head.

5) No. 9 guide lever adjustment

1. Set the VTR to Cue mode with E-240 tape (at beginning portion) loaded. Switch the Cue mode to the review mode when the tape has been rewound into the T-reel table to some extent.
2. Check tape wrinkle at the upper and lower flange of No. 8 guide. Check the tape does not come off from the flange while running. If the tape comes off from the flange, replace the pinch lever, capstan motor or No. 9 guide lever since the part(s) is (are) defective.

Note:
- Modify the lid of the cassette for the alignment tape E-240 previsously so that the alignment is performed easily.

6)Check for transitional operation from Review to Play, slot-in to play

1. Play back the 3 MHz video signal (LP mode) on the alignment tape in Review mode and observe the video envelope with the oscilloscope.
2. Switch the Review mode to the Play mode. When switched to the Play mode, make sure the entrance side envelope comes to an approximate steady state within 3s as shown in **Fig. 7-3-9**. If it does not rise within 3s, take the following steps.starting 4).
3. Switch the cassette slot-in mode to the Play mode. As in item 2), if it does not rise within 3s, adjust as follows.

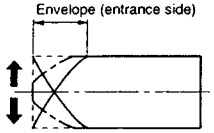


Fig. 7-3-9

Video envelope rising when operation mode is switched from review to play mode

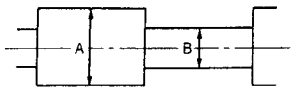
4. Adjust the S guide roller and perform the linearity adjustment again.
5. Check above items 2) and 3) to see that the video envelope rises within 3s. If not, S slider assembly or the tension lever is damaged. Replace either (or both) of them.

Note:
- If the rising characteristic is poor in Review mode, screen noise may occur in synchronous editing recording. Perform the adjustment carefully.

7) Envelope check

1. Make recordings and play back the tapes (E-180 and E-240) in SP and LP modes and make sure the playback output envelope meets the specifications shown in **Fig. 7-3-5**.
2. In playback the tape (with a E- 180), the video envelope should meet the specification as shown in **Fig. 7-3-10**.

Note:
- Check for both modes, SP and LP. Also check for AFM envelope when using a Hi-Fi model.



• B/A ≧ 0.55

Fig. 7-3-10

Envelope output and output difference

3. If the performance does not meet both specifications above 1 and 2 above, replace the upper cylinder assembly.
4. Set the VTR to Rec mode (LP) with the E-180 tape loaded (at the beginning part) and check operation of the synchronous editing recording.
5. If picture noises are observed at the starting position of the editing, perform "6) Check for transitional operation from Review to Play, slot-in to play".

8) Tape wrinkle check

1. Playback the E-240 tape in the normal Play mode, CUE mode, Review mode and the frame advance mode, and check each guide for wrinkle.
2. If excessive tape wrinkle is observed at the mode shown, perform the associated adjustments also shown. (The parts described in ( ) may need to replace.)

a. Playback mode

Tape wrinkle at the S, T-guide rollers section

Item 3) Linearity adjustment
(Slider assembly)

Tape wrinkle at No. 8 guide flange

Item 1) ACE head assembly coarse adjustment
(Pinch roller)

Tape wrinkle at lower flange of No. 1 guide

Item 6) Check for transitional operations from Review to Play, and Slot-In to Play
(Tension lever)

b. Review mode

Tape wrinkle at No. 8 guide

Item 1) ACE head assembly coarse adjustment
(Pinch lever, No. 9 guide lever, capstan motor)

Tape wrinkle at the guide rollers
Guide roller adjustment
(Slider assembly)

c. Frame advance mode

Tape wrinkle at No. 8 guide
Item 3) Linearity adjustment
(Pinch lever, capstan motor)

9) Maximum AFM envelope output point check (Hi-Fi model)

1. Playback the SP mode 3 MHz video signal and the 400 Hz AFM signal on the alignment tape.
2. Trigger the oscilloscope with the video switching pulse, adjust the tracking control and check the control pulse phase at the maximum video envelope (A ch) output point.
3. Make sure the control pulse phase difference among each maximum point of AFM envelope, A ch and B ch is within ± 3 ms with the above point used as the basic reference.

Note:
If the phase difference exceeds 3 ins, replace the upper cylinder.

2. ELECTRICAL ADJUSTMENT
<Test equipment required>

Adjustment will be performed with the following test equipment.

1. Color TV (Monitor)
2. Oscilloscope, 2 CHs, 15 MHz or higher with delay system
3. Frequency counter (7 digits or higher)
4. Millivoltmeter
5. Digital voltmenter
6. Tester (20 kΩ/V)
7. Audio generator
8. Audio attenuator
9. Alignment tapes
   Part code:
   ST-C6: 70909409, ST-C7: 70909410
10. Alignment screw driver (jig)
11. Color pattern generator
12. Video sweep generator

<Color bar signal>
Color bar signals of 75% recorded on the alignment tapes are shown in **Fig. 2-1-1**.

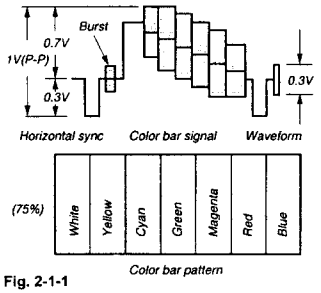


Fig. 2-1-1

<Specified input and output levels, and impedance>

Video input:
Negative sync, standard composite video signal 1 V(p-p), 75Ω

Video output:
Same as the video input 1 V(p-p), 75Ω

Audio input:
308 mV(rms), more than 47 kΩ (phono type), more than 10 kΩ (21 pin type)

Audio output:
308 mV(rms), less than 4.7 kΩ (phono type), less than 1.0 kΩ (21 pin type)

<Alignment sequence>

Recorded the alignments in the sequence as shown in **Fig. 2-1-2**.

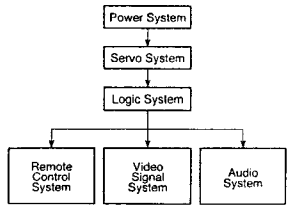


Fig. 2-1-2

Alignment tape specifications

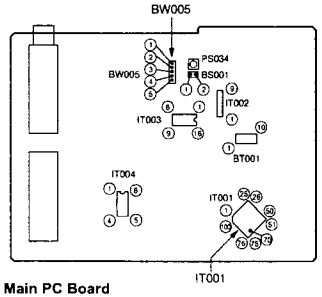
[1] ST-C6

Segment	System	Playback Time (min)	Video Signal	Audio Signal	Applications
1	PAL & SECAM	10	Mono Scope	1 kHz	Playback phase check, audio level check
2	PAL & SECAM	5	3 MHz A ch	400 Hz and 7 kHz	ACE head position adjustment, ACE head azimuth adjustment, Linearity adjustment ACE head position adjustment,
3	PAL & SECAM	5	3 MHz A ch	1 kHz (stereo)	ACE head height adjustment, Linearity adjustment
4	PAL	5	Color bar	3 kHz	Video and Sound checks
5	SECAM	5	Color bar	3 kHz	Video and Sound checks
6	MESECAM	5	Color bar	3 kHz	Video and Sound checks
7	NTSC	5	Color bar	1 kHz	Video and Sound checks

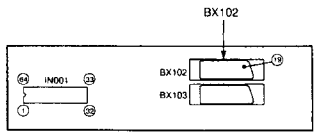
[2] ST-C7

Segment	System	Playback Time (min)	Mode	Video Signal	Audio Signal	Applications
1	PAL	5	LP	3MHz A ch	500 Hz (stereo)	ACE head position adjustment, ACE head height adjustment, Linearity adjustment
2	PAL	3	LP	Color bar	3.2 kHz	LP mode operation check, ACE head azimuth check and adjustment
3	PAL	3	SP	Color bar	AFM 400 Hz	SP mode operation check, AFM check
4	PAL & SECAM	5	SP	3 MHz A ch	AFM 400 Hz	AFM tracking checks
5	SECAM	5	LP	3 MHz A ch	No signal	Linearity adjustment
6	SECAM	3	LP	Color bar	No signal	LP mode operation check
7	SECAM	3	SP	Color bar	AFM 400 Hz	SP mode operation check, AFM check

2-1. Servo Circuit



Main PC Board



Terminal PC Board

2-1-1. Playback Phase (PG) Adjustment

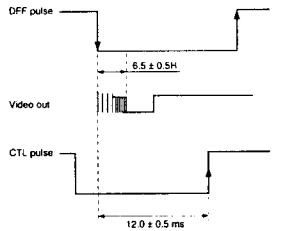
Test point:
BW005, Pin 19 of BX102 (Video out)

Test equipment:
Oscilloscope

1. Play back the alignment tape. Confirm that phase difference between the fall of the DFF pulse (pin 3 of BW005) and the rise of CTL pulse (pin 4 of BW005) is 12±0.5ms.
2. Further, observe the envelope (pin I of BW005) waveform, and confirm that the ACE head position adjustment and linearity adjustment have been made, and C-SYNC (pin 70 of IT001) is being input during playback.
3. Set the VTR to the STOP mode.
4. Press the unit's channel up/down buttons simultaneously for more than 5s.
5. Afterwards, within 2s, press the PLAY button on the remote control unit.
6. The automatic adjustment will be made for about 10s, all the displays will blink. If the automatic adjustment is not carried out, confirm that the alignment tape has a safety tab or not, and redo from the step 3.

1) When adjustment has been completed:
The display will blink for 10s, stop blinking and return to the normal display in the STILL mode, then it shifts to the playback display in the play back mode.

2) When adjustment fails:
It goes into the STOP mode.

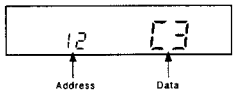


7. Confirm that the play indicator is displayed, and confirm that the rising and falling edge of the SW pulse is 6.5 ± 0.5H from the V-sync front edge of the video signal.

2-1-2. When IT004 is Replaced

When IT004 is replaced, the data in the VTR is required to memorize in the new one. So perform the following procedures.

1. Press the channel up/down buttons on the VTR simultaneously for more than Ss while the display blinks and the unit is in the power off mode.
2. And then within 2s, press the CANCEL button on the remote control unit.
3. After displaying the address at the channel display area and the data at the minute display area, set the address to 12 using the channel up/down buttons on the remote control unit. Next, set the data to C3 using the FF/REW buttons on the remote control unit. The data goes up using FF button and down using REW button.

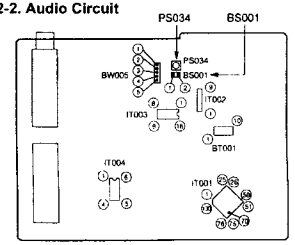


4. Set each address and data in the table following the description above.

Address	Data
24	0A
25	03
26	15
27	0A

5. Perform the adjustment described in the item "2-1-1. Playback Phase (PG) Adjustment".
6. Pull out the power cord plug from the AC outlet once and insert the power cord plug into the AC outlet again.
7. Perform the channel presetting as the IT004 replaced has no channel data.

2-2. Audio Circuit



Main PC Board

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Electrical Adjustments Cont'd

2-2-1. Bias Level Adjustment

Test point: Pins 1 and 2 of BS001
Test equipment: Millivoltmeter
Adjusting point: P5034

1. Set the VTR to record mode.
2. Connect pin 2 to the millivoltmeter and pin 1 to ground.
3. Adjust PS034 to obtain 2.6 ± 0.1 mV (rms).

2-3. Self Diagnosis Function

2-3-1. Outline

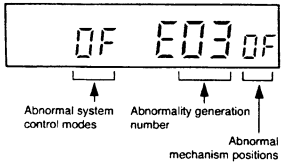
When a tape running stops or the VTR enters the power OFF mode, etc. due to some abnormality, the abnormality is stored in the EEPROM and displayed on the display tube.

2-3-2. Storing abnormal modes

- The abnormality is classed into 5 groups, and the abnormality number, system control mode, and the mechanism position at which the abnormality occurred are stored in the EEPROM.
- The writing timing is just after the abnormality occurred.

2-3-3. Abnormality mode display

- Press the CH UP and CH DOWN buttons on the VTR simultaneously for more than Ss.
- And then within 2s, press the STILL button on the remote control.
- The system control mode at which the abnormality occurred is displayed at the channel display area, "E" is displayed at the hour digit, abnormality generation number is displayed at the minute digit, and the mechanism position is displayed in the second digit position.
- The abnormality mode is displayed regardless of the power on off.



- When the Counter Reset button is pressed in the display period, the abnormality display data is initialized and "-" is displayed.

The data displayed is as follows:

Abnormality generation number

01	Cylinder stop
02	Reel abnormality (take up)
03	Reel abnormality (supply)
04	Abnormal slot in/ slot out
05	Abnormal loading

Abnormal system control modes

00	Standby
01	Stop
02	Rewind
03	Review
04	FF
05	Cue
06	Playback
07	Still, slow playback
08	X2 speed
09	Unloading stop
0A	Reverse playback
0b	Still in reverse playback, Reverse slow playback
0C	Recording
0d	Record pause
0E	Power off eject
0F	Eject
10	Short FF
11	Short REW

Abnormal mechanism positions

01	F/L out
03	F/L down
05	Loading/unloading
07	Reverse rotation with pinch roller ON
09	Playback with pinch roller ON
0b	Stop with main brake ON
0d	FF/REW
0F	Position detection impossible

Positions 0, 2, 4 exist as mechanism positions. For example, 8 shows a position between 7 and 9 (between playback position and review position).

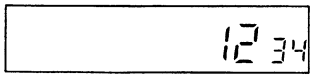
2-3-4. Cylinder rotation time display

1) Outline
All the time for which the cylinder is ON is counted, memorized on EEPROM, and indicated on the display tube.

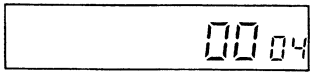
2) Display method
- Press the "CH UP" and "CH DOWN" button on the main unit for more 5 sec. at the same time.
- Next, within 2 sec. press the "STOP" button on the remote control.
- The cumulative operation time of the cylinder will be displayed for 30 sec. The time unit is an hour.

3) Example of display

- In case of 1234 hours.



- In case of 4 hours.



2-4. 3DNR Module Troubleshooting Flow Chart

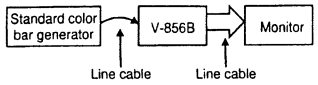
3DNR module (HR001) is checked with the following procedures, and if some defects are found, replace the module with new one.

2-4-1. Example of operation check procedure

1) Preparing equipments

- V-856B
- Standard color bar generator
- Alignment tape

2) Connection procedure



3) Operation check procedure
Turning [3DNR] off. —> Playback the tape which the color bar signal is recorded. —> Turning [3DNR] on after checking whole murky noises on the color bar. Be sure that whole noises are reduced in this status.

2-4-2. Troubleshooting flow chart

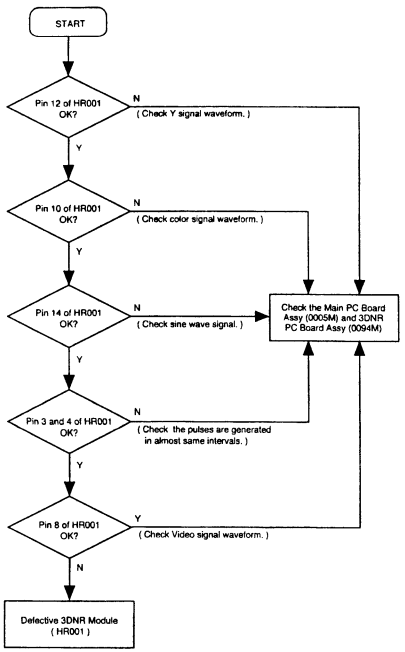
Procedure 1.
First, check the power supply voltage and the installation state of the 3DNR module.

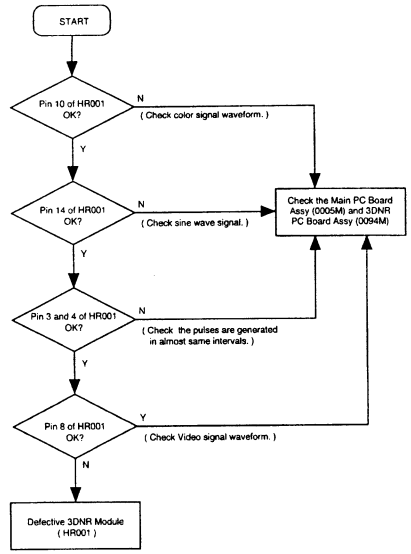
Procedure 2.
Classify the defective symptoms into groups. Check the screen on playback according to the operation check procedure **2-4-1**.

Procedure 3.
Check the defects according to the flow chart.

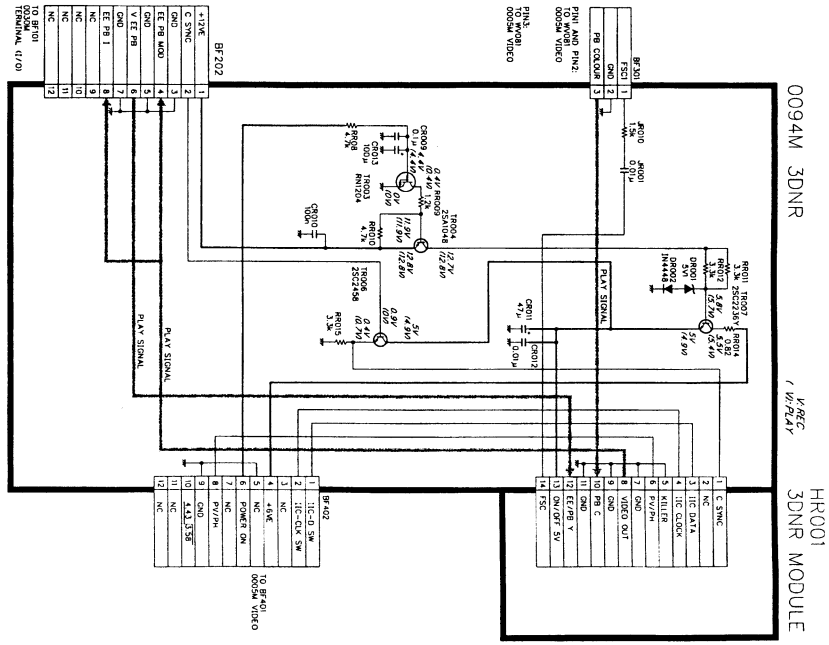
No.	Defective symptoms	Flow chart
(1)	No display appears when playing-back, or large turbulence and noises occur.	A
(2)	No color appears when playing-back, or color noises appear a lot.	B

Troubleshooting Guides


START
Pin 12 of HR001 OK?
N
(Check Y signal waveform.)
Y
Pin 10 of HR001 OK?
N
(Check color signal waveform.)
Y
Pin 14 of HR001 OK?
N
(Check sine wave signal.)
Check the Main PC Board Assy (0005M) and 3DNR PC Board Assy (0094M)
Y
Pin 3 and 4 of HR001 OK?
N
(Check the pulses are generated in almost same intervals.)
Y
Pin 8 of HR001 OK?
Y
(Check Video signal waveform.)
N
Defective 3DNR Module (HR001)


START
Pin 10 of HR001 OK?
N
(Check color signal waveform.)
Y
Pin 14 of HR001 OK?
N
(Check sine wave signal.)
Check the Main PC Board Assy (0005M) and 3DNR PC Board Assy (0094M)
Y
Pin 3 and 4 of HR001 OK?
N
(Check the pulses are generated in almost same intervals.)
Y
Pin 8 of HR001 OK?
Y
(Check Video signal waveform.)
N
Defective 3DNR Module (HR001)

3DNR Diagram



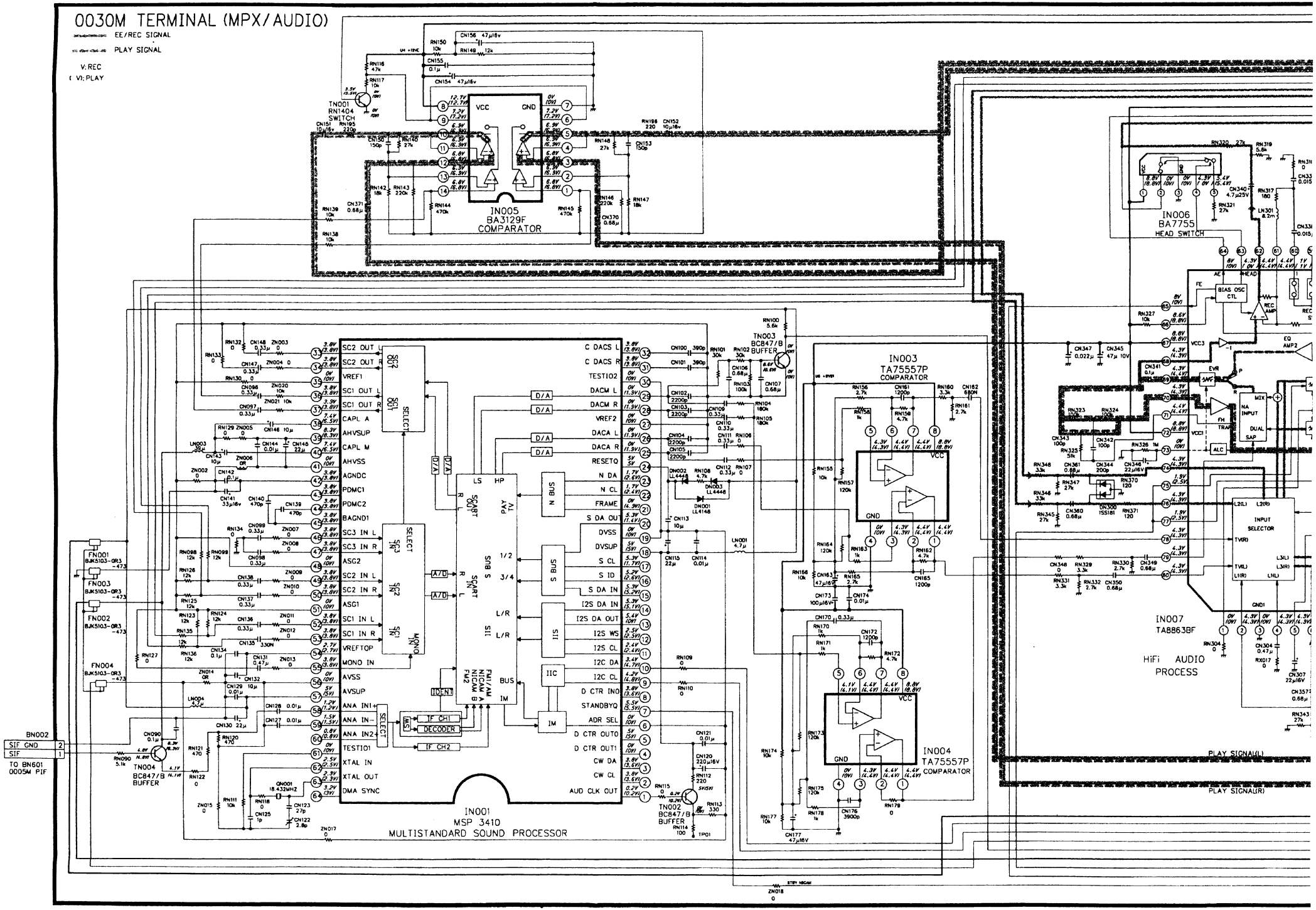
0030M TERMINAL (MPX/AUDIO)

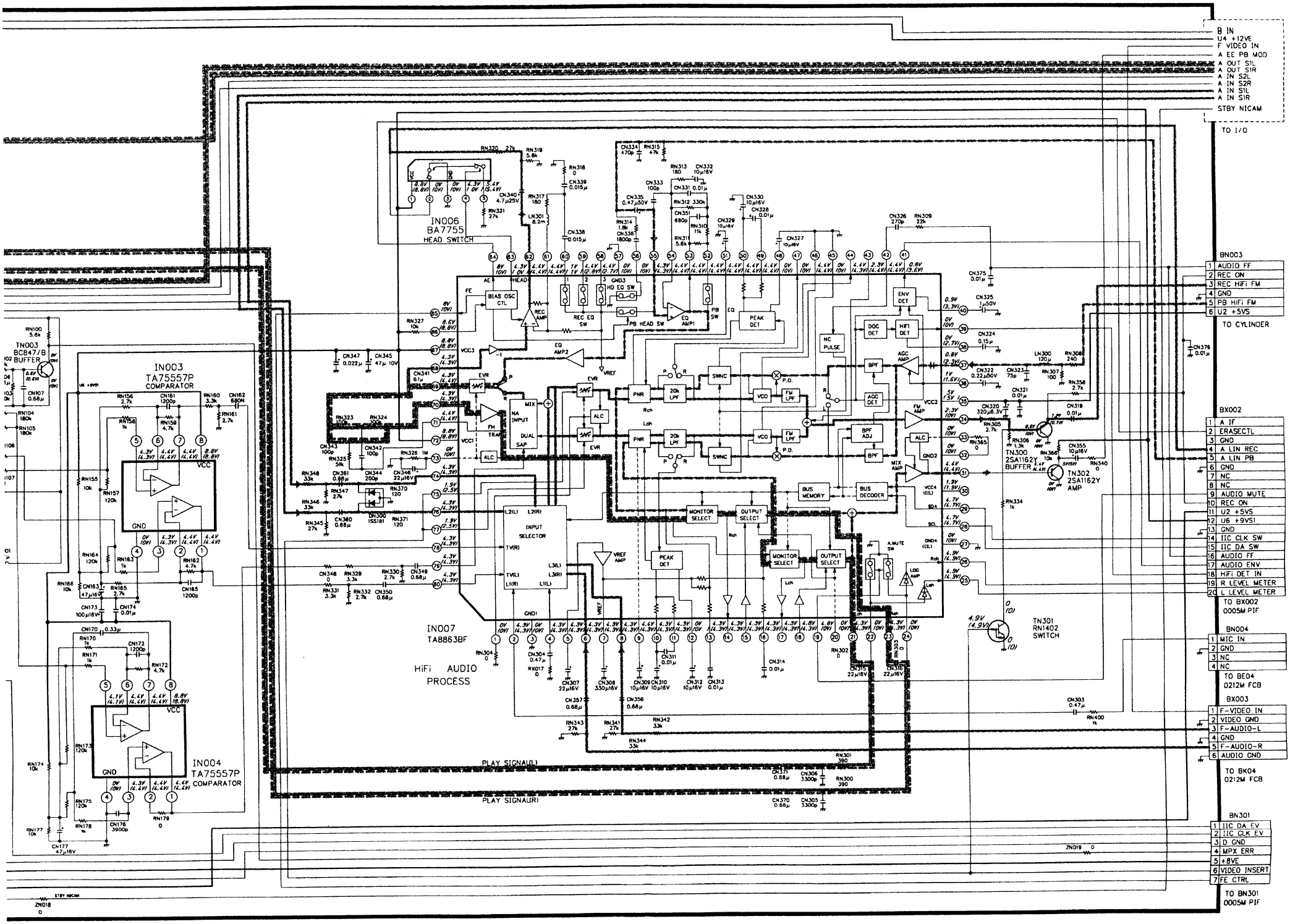
EE/REC SIGNAL

PLAY SIGNAL

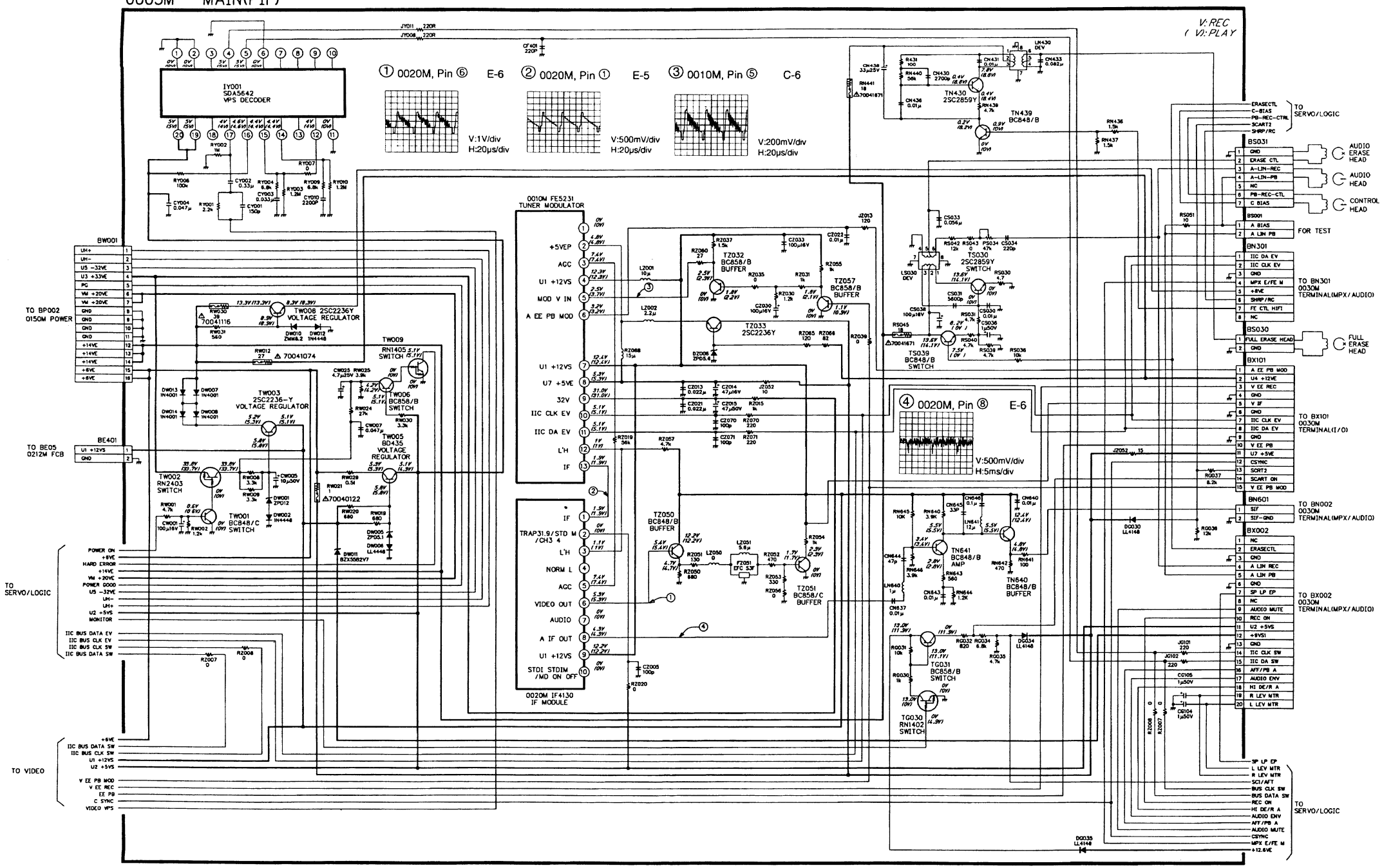
V: REC

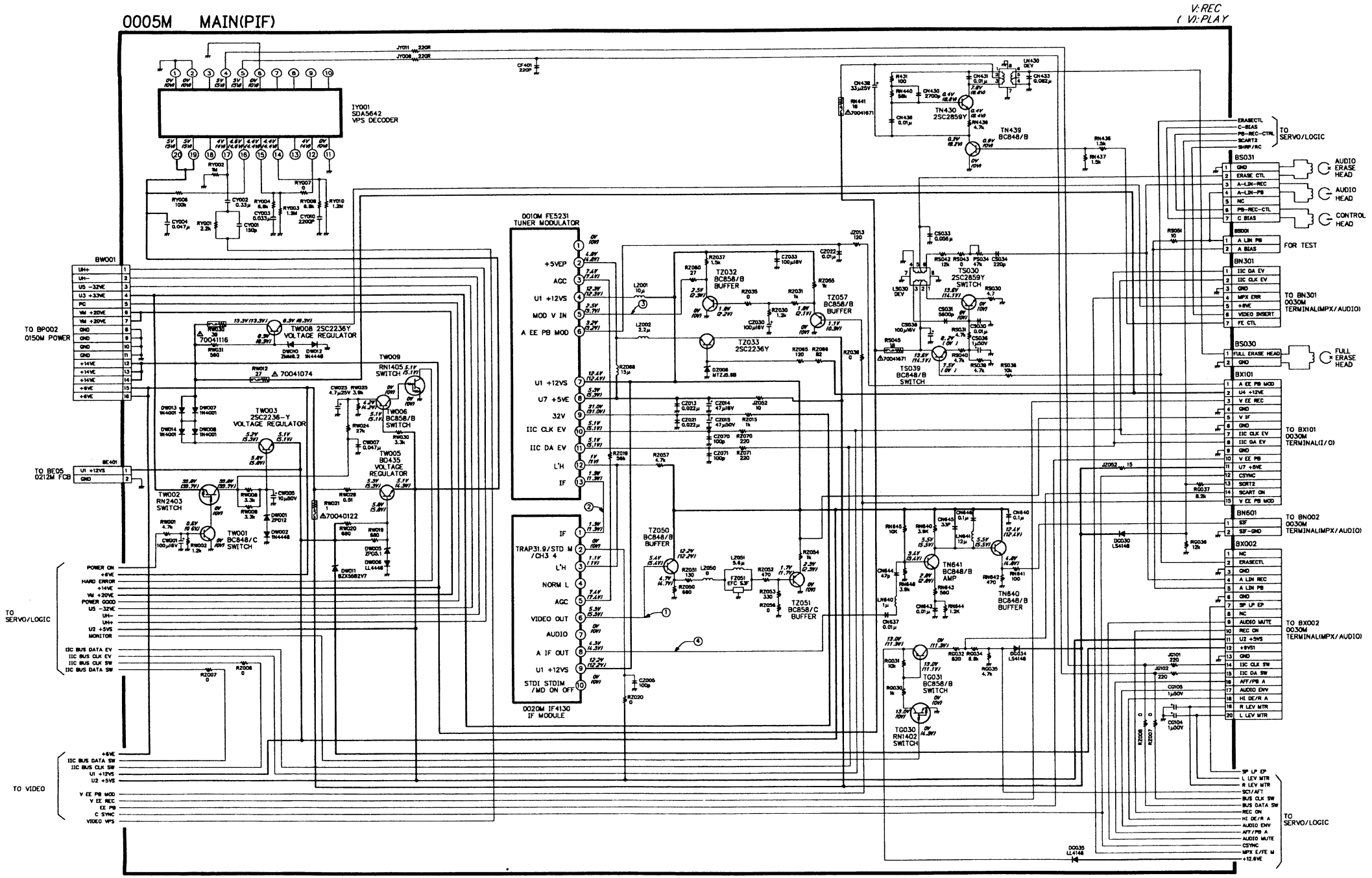
(V): PLAY



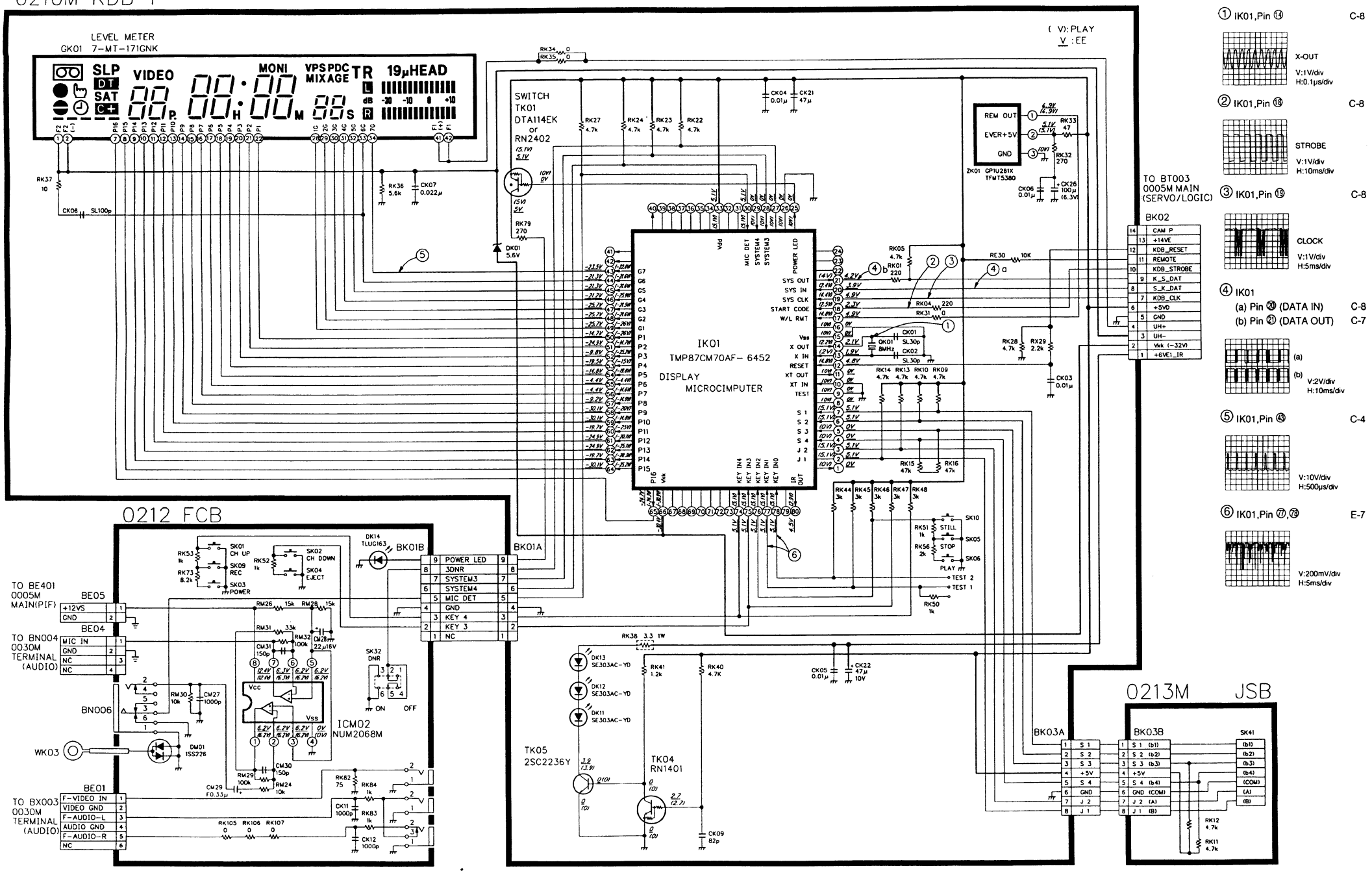

B IN
U4 +12VE
F VIDEO IN
A EE PB MOD
A OUT S1L
A OUT S1R
A IN S2L
A IN S2R
A IN S1L
A IN S1R
STBY NICAM
TO I/O
IN006
BA7755
HEAD SWITCH
IN003
TA75557P
COMPARATOR
TN003
BC847/B
BUFFER
IN004
TA75557P
COMPARATOR
IN007
TA8863BF
HiFi AUDIO
PROCESS
TN300
2SA1162Y
BUFFER
TN302
2SA1162Y
AMP
TN301
RN1402
SWITCH
PLAY SIGNAL(L)
PLAY SIGNAL(R)
BN003
1 AUDIO FF
2 REC ON
3 REC HiFi FM
4 GND
5 PB HiFi FM
6 U2 +5VS
TO CYLINDER
BX002
1 A IF
2 ERASECTL
3 GND
4 A LIN REC
5 A LIN PB
6 GND
7 NC
8 NC
9 AUDIO MUTE
10 REC ON
11 U2 +5VS
12 U6 +9VS1
13 GND
14 IIC CLK SW
15 IIC DA SW
16 AUDIO FF
17 AUDIO ENV
18 HiFi DET IN
19 R LEVEL METER
20 L LEVEL METER
TO BX002
0005M PIF
BN004
1 MIC IN
2 GND
3 NC
4 NC
TO BE04
0212M FCB
BX003
1 F-VIDEO IN
2 VIDEO GND
3 F-AUDIO-L
4 GND
5 F-AUDIO-R
6 AUDIO GND
TO BK04
0212M FCB
BN301
1 IIC DA EV
2 IIC CLK EV
3 D GND
4 MPX ERR
5 +8VE
6 VIDEO INSERT
7 FE CTRL
TO BN301
0005M PIF

0005M MAIN(PIF)




0005M MAIN(PIF)
V:REC
(V):PLAY
1Y001
SDA5642
VPS DECODER
0010M FE5231
TUNER MODULATOR
+5VEP
AGC
U1 +12VS
MOD V IN
A EE PB MOD
U1 +12VS
U7 +5VE
32V
IIC CLK EV
IIC DA EV
L'H
IF
IF
TRAP31.9/STD M /CH3 4
L'H
NORM L
AGC
VIDEO OUT
AUDIO
A IF OUT
U1 +12VS
STDI STDIM /MD ON OFF
0020M IF4130
IF MODULE
BW001
TO BP002
0150M POWER
TW008 2SC2236Y
VOLTAGE REGULATOR
TW009
RN1405
SWITCH
TW006
BC858/B
SWITCH
TW003
2SC2236-Y
VOLTAGE REGULATOR
TW002
RN2403
SWITCH
TW005
BC435
VOLTAGE REGULATOR
TW001
BC848/C
SWITCH
BE401
TO BE05
0212M FCB
TO
SERVO/LOGIC
POWER ON
+8VE
HARD ERROR
+14VE
VM +20VE
POWER GOOD
U5 -32VE
UH-
UH+
U2 +5VS
MONITOR
IIC BUS DATA EV
IIC BUS CLK EV
IIC BUS CLK SW
IIC BUS DATA SW
TO VIDEO
+8VE
IIC BUS DATA SW
IIC BUS CLK SW
U1 +12VS
U2 +5VS
V EE PB MOD
V EE REC
EE PB
C SYNC
VIDEO VPS
TZ032
BC858/B
BUFFER
TZ033
2SC2236Y
TZ057
BC858/B
BUFFER
TS030
2SC2859Y
SWITCH
TS039
BC848/B
SWITCH
TZ050
BC848/B
BUFFER
TZ051
BC858/C
BUFFER
TN430
2SC2859Y
TN439
BC848/B
TN641
BC848/B
AMP
TN640
BC848/B
BUFFER
TG031
BC858/B
SWITCH
TG030
RN1402
SWITCH
TO
SERVO/LOGIC
ERASECTL
C-BIAS
PB-REC-CTRL
SCART2
SHMP/RC
BS031
GND
ERASE CTL
A-LIN-REC
A-LIN-PB
NC
PB-REC-CTL
C BIAS
AUDIO ERASE HEAD
AUDIO HEAD
CONTROL HEAD
BS001
A LIN PB
A BIAS
FOR TEST
BN301
IIC DA EV
IIC CLK EV
GND
MPX ERR
+8VE
VIDEO INSERT
FE CTL
TO BN301
0030M
TERMINAL(MPX/AUDIO)
BS030
FULL ERASE HEAD
GND
FULL ERASE HEAD
BX101
A EE PB MOD
U4 +12VE
V EE REC
GND
V IF
GND
IIC CLK EV
IIC DA EV
GND
V EE PB
U7 +8VE
CSYNC
SCRT2
SCART ON
V EE PB MOD
TO BX101
0030M
TERMINAL(I/O)
BN601
SIF
SIF-GND
TO BN002
0030M
TERMINAL(MPX/AUDIO)
BX002
NC
ERASECTL
GND
A LIN REC
A LIN PB
GND
SP LP EP
NC
AUDIO MUTE
REC ON
U2 +5VS
+8VS1
GND
IIC CLK SW
IIC DA SW
AFF/PB A
AUDIO ENV
HI DE/R A
R LEV MTR
L LEV MTR
TO BX002
0030M
TERMINAL(MPX/AUDIO)
SP LP EP
L LEV MTR
R LEV MTR
SCI/AFT
BUS CLK SW
BUS DATA SW
REC ON
HI DE/R A
AUDIO ENV
AFF/PB A
AUDIO MUTE
CSYNC
MPX E/FE M
+12.8VE
TO
SERVO/LOGIC

0210M KDB 1



① IK01,Pin ⑭ C-8

X-OUT
V:1V/div
H:0.1μs/div

② IK01,Pin ⑱ C-8

STROBE
V:1V/div
H:10ms/div

③ IK01,Pin ⑲ C-8

CLOCK
V:1V/div
H:5ms/div

④ IK01
(a) Pin ⑳ (DATA IN) C-8
(b) Pin ㉑ (DATA OUT) C-7

(a)
(b)
V:2V/div
H:10ms/div

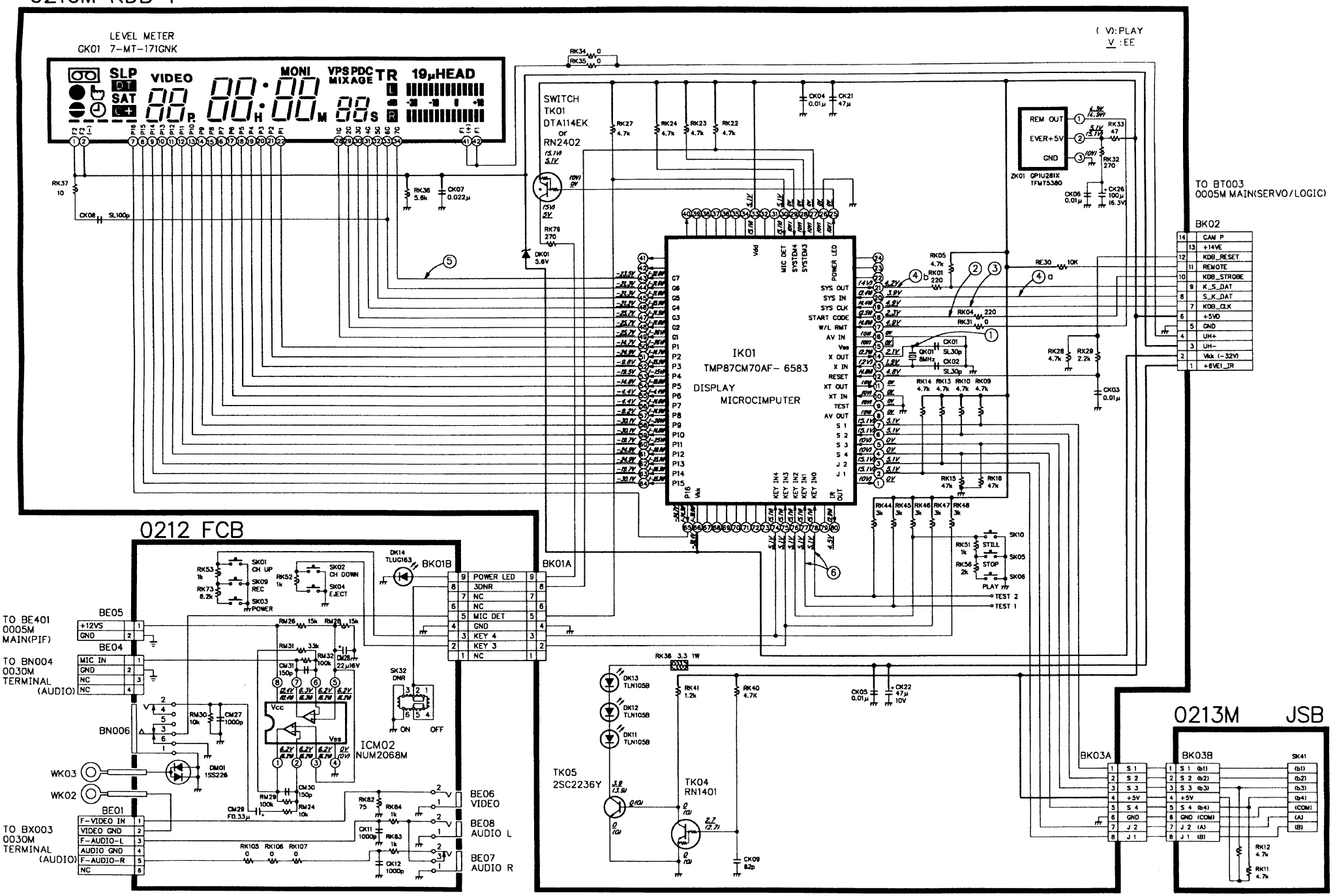
⑤ IK01,Pin ㊸ C-4

V:10V/div
H:500μs/div

⑥ IK01,Pin ㊼,㊾ E-7

V:200mV/div
H:5ms/div

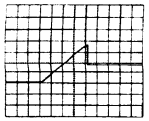
0210M KDB 1


LEVEL METER
GK01 7-MT-171GNK
SLP
SAT
VIDEO
MONI
VPS PDC
MIXAGE
TR
19μHEAD
(V):PLAY
V :EE
SWITCH
TK01
DTA114EK
or
RN2402
IK01
TMP87CM70AF- 6583
DISPLAY
MICROCIMPUTER
REM OUT
EVER+5V
GND
ZK01 GP1U281X
TFMT5380
TO BT003
0005M MAIN(SERVO/LOGIC)
BK02
CAM P
+14VE
KDB_RESET
REMOTE
KDB_STROBE
K_S_DAT
S_K_DAT
KDB_CLK
+5VD
GND
UH+
UH-
Vblk (-32V)
+8VE1_IR
0212 FCB
BK01A
BK01B
POWER LED
3DNR
MIC DET
KEY 4
KEY 3
SK01 CH UP
SK02 CH DOWN
SK03 POWER
SK04 EJECT
SK09 REC
SK10
SK05
SK06
STILL
STOP
PLAY
TEST 2
TEST 1
TO BE401
0005M
MAIN(PIF)
BE05
+12VS
GND
TO BN004
0030M
TERMINAL
(AUDIO)
BE04
MIC IN
NC
BN006
WK03
WK02
BE01
F-VIDEO IN
VIDEO GND
F-AUDIO-L
AUDIO GND
F-AUDIO-R
TO BX003
0030M
TERMINAL
(AUDIO)
ICM02
NUM2068M
BE06
VIDEO
BE08
AUDIO L
BE07
AUDIO R
TK05
2SC2236Y
TK04
RN1401
0213M JSB
BK03A
BK03B
SK41

0150M POWER

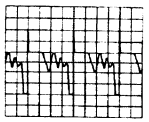
V :REC
(V): PLAY
[V]: EE

① IP001, Pin ⑪ E-4



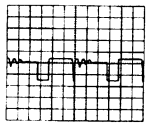
START-UP
Vcc
V:50V/div
H:10ms/div

② TP001, Collector D-5



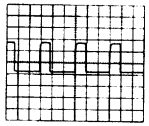
V:550Vp-p
H:40μs/div

③ IP002, Pin ⑤ F-9



V:1V/div
H:5μs/div

④ IP002, Pin ⑦ F-8



V:5V/div
H:10μs/div

IP001
U4614B
SWITCHING CONTROL IC

IP002
LM393
DUAL
VOLTAGE
COMPARATOR

TP001
BUL310XI
FEEDBACK
SEPARATOR

TP091
2SA1020-Y
REVERSE
CURRENT
BIAS

TP092
BC337

BP002
1 UH+
2 UH−
3 U5 −32VE
4 U3 +33VE
5 POWER GOOD
6 VM +20VE
7 VM +20VE
8 GND
9 GND
10 GND
11 GND
12 +14VE
13 +14VE
14 +14VE
15 +6VE
16 +6VE

TO BW001
0005M MAIN(PIF)

0030M TERMINAL (I/O)

REC SIGNAL
PLAY SIGNAL
V: REC
(VI: PLAY

BX103 SCART2

BX102 SCART1

A IN S2R
A IN S2L
A OUT S1R — PLAY SIGNAL
A OUT S1L — PLAY SIGNAL
TO MPX/AUDIO (PAGE3-60) — A IN S1R — AUDIO (R) LINE INPUT SIGNAL
A IN S1L — AUDIO (L) LINE INPUT SIGNAL
U4 +12VE
A EE PB MOD
B IN
F VIDEO IN
STBY NICAM

VIDEO PLAYBACK SIGNAL

IX101
STV6400
DOUBLE SCART INTERFACE

VIDEO LINE INPUT SIGNAL

BN391 AUDIO OUT L
BN393 AUDIO OUT R

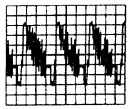
BF101
+12VE	1
CSYNC	2
GND	3
EE PB MOD	4
GND	5
V EE PB	6
GND	7
EE PB I	8
NC	9
NC	10
NC	11
NC	12

TO BF202 0094M 3DNR (PAGE3-56)

BX101
15	V EE PB MOD
14	SCART ON
13	SCRT2
12	CSYNC
11	U7 +5VE
10	V EE PB
9	GND
8	IIC DA EV
7	IIC CLK EV
6	GND
5	V IF
4	GND
3	V EE REC
2	U4 +12VE
1	A FF PB MOD

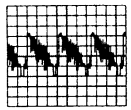
TO BX101 0005M PIF (PAGE3-39)

① IX101, Pin ② E-8



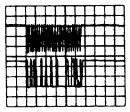
V:200V/div
H:20μs/div

② IX101, Pin ⑯ E-6

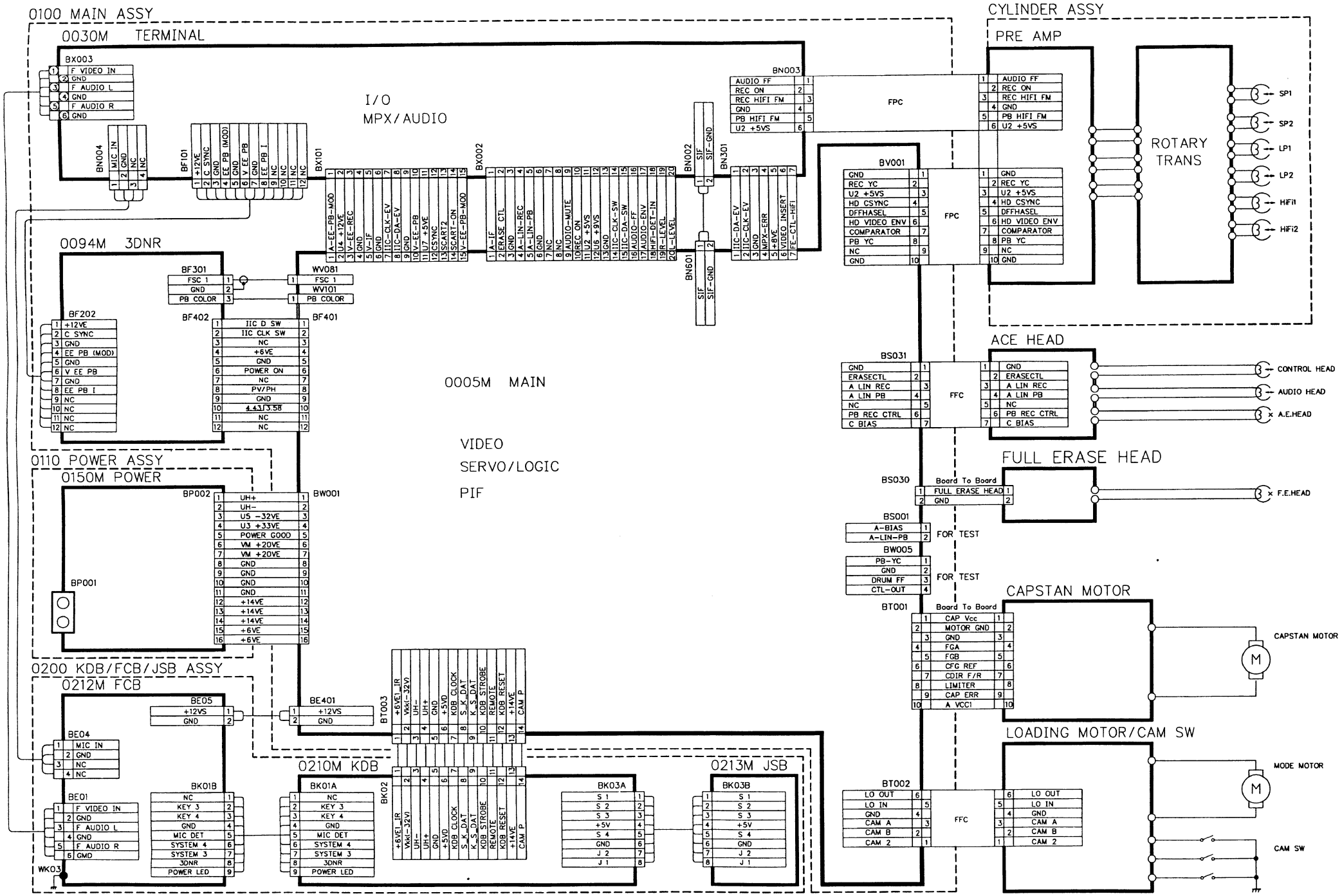


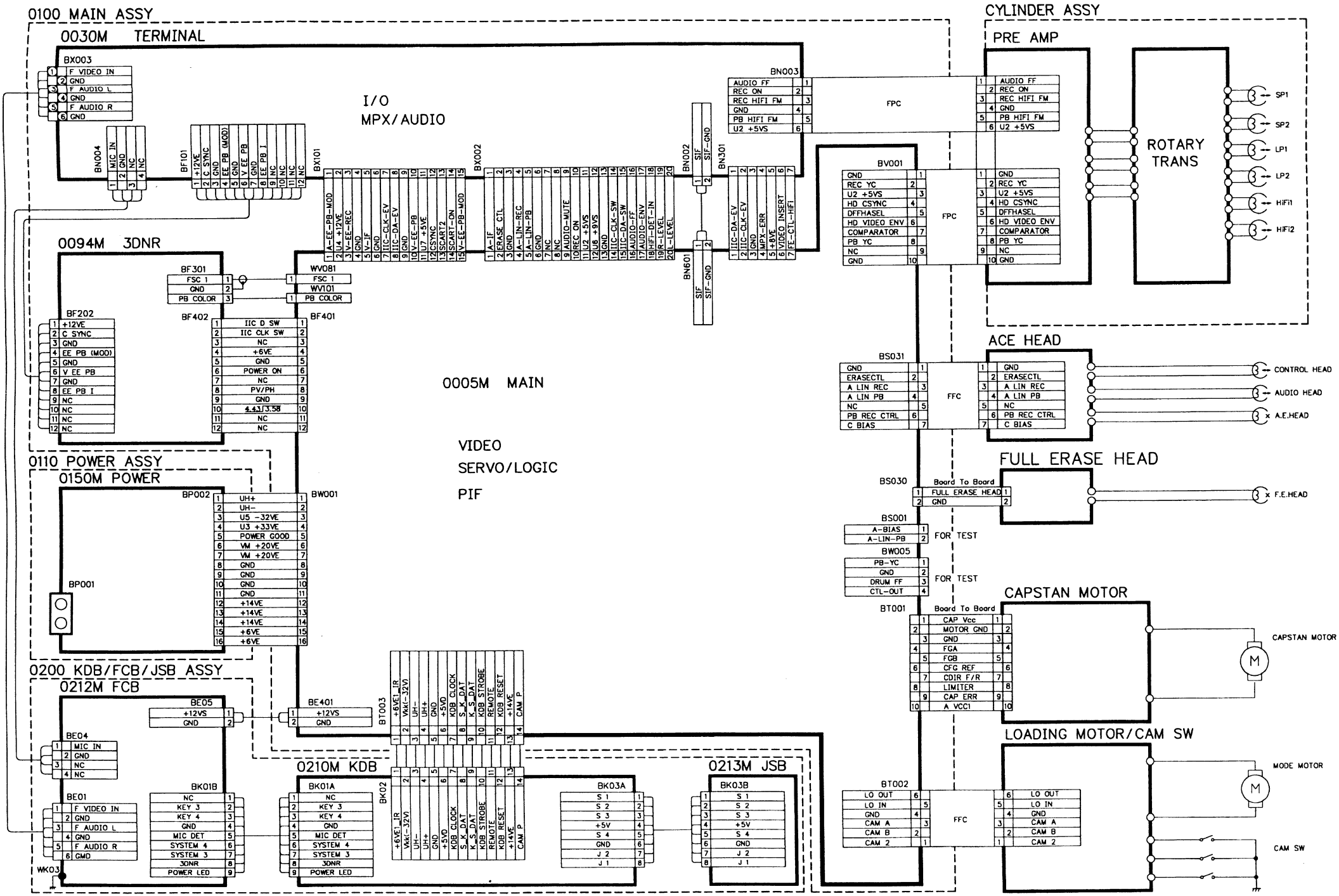
V:500mV/div
H:20μs/div

③ IX101
(a) Pin ⑪ (SCL) F-6
(b) Pin ⑨ (SDA) F-8

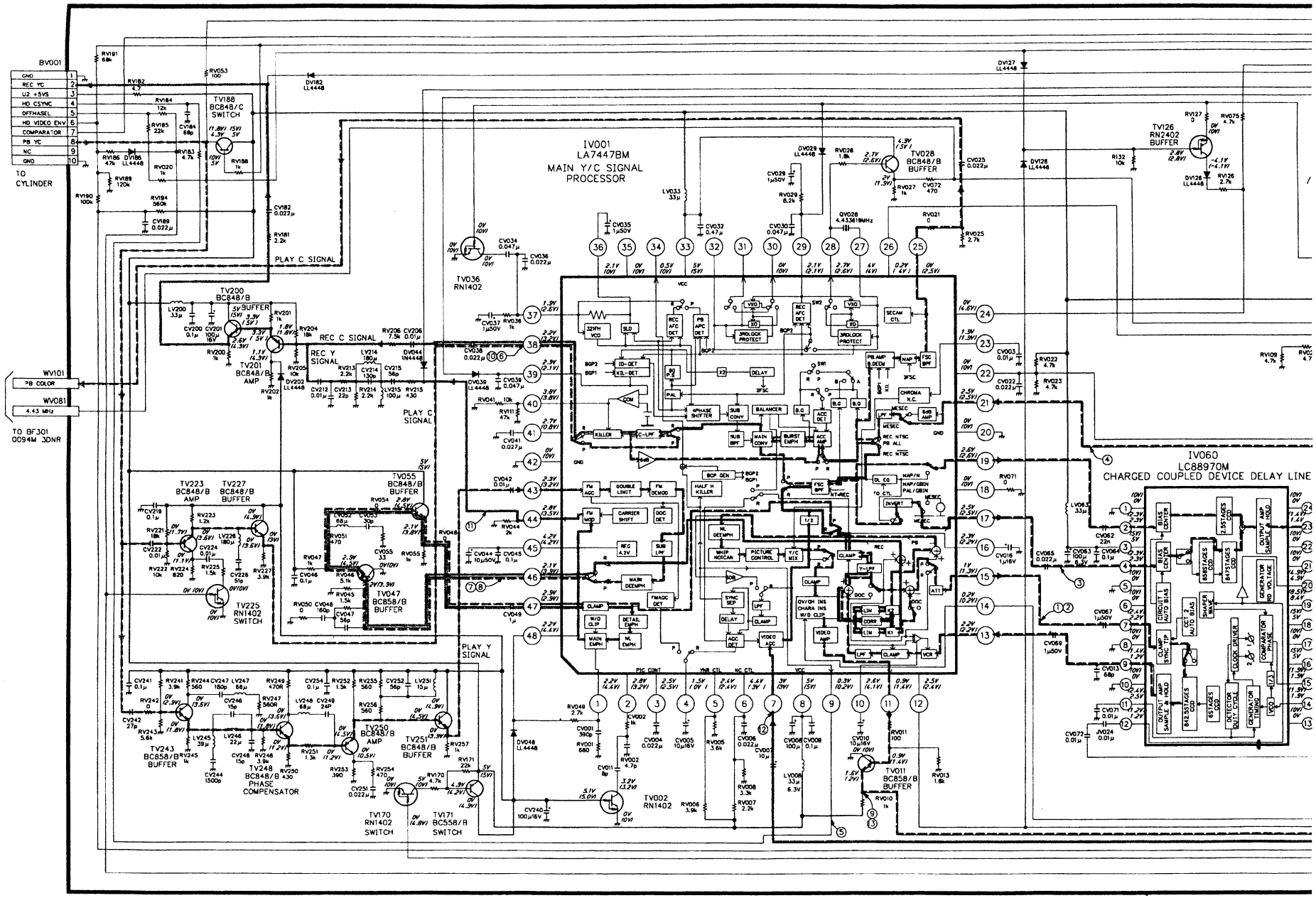


(a)
(b)
V:2V/div
H:200μs/div

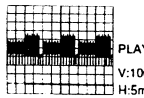

0100 MAIN ASSY
0030M TERMINAL
BX003
F VIDEO IN
GND
F AUDIO L
GND
F AUDIO R
GND
BN004
MIC IN
GND
NC
NC
BF101
+12VE
C SYNC
GND (MOD)
EE PB (MOD)
V EE PB
GND
EE PB I
NC
NC
NC
BX101
A-EE-PB-MOD
U4 +12VE
V-EE-REC
GND
V-IF
GND
IIC-CLK-EV
IIC-DA-EV
GND
V-EE-PB
U7 +5VE
CSYNC
SCART2
SCART-ON
V-EE-PB-MOD
I/O
MPX/AUDIO
BX002
A-IF
ERASE CTL
GND
A-LIN-REC
A-LIN-PB
GND
NC
NC
AUDIO-MUTE
REC ON
U2 +5VS
U6 +9VS
GND
IIC-CLK-SW
IIC-DA-SW
AUDIO-FF
AUDIO-ENV
HIFI-DET-IN
R-LEVEL
L-LEVEL
BN002
SIF
SIF-GND
BN601
SIF
SIF-GND
BN301
IIC-DA-EV
IIC-CLK-EV
GND
MPX-ERR
+8VE
VIDEO INSERT
FE-CTL-HIFI
BN003
AUDIO FF
REC ON
REC HIFI FM
GND
PB HIFI FM
U2 +5VS
FPC
CYLINDER ASSY
PRE AMP
ROTARY TRANS
SP1
SP2
LP1
LP2
HiFi1
HiFi2
BV001
GND
REC YC
U2 +5VS
HD CSYNC
DFFHASEL
HD VIDEO ENV
COMPARATOR
PB YC
NC
GND
FPC
0094M 3DNR
BF301
FSC 1
GND
PB COLOR
WV081
FSC 1
WV101
PB COLOR
BF202
+12VE
C SYNC
GND
EE PB (MOD)
GND
V EE PB
GND
EE PB I
NC
NC
NC
NC
BF402
IIC D SW
IIC CLK SW
NC
+6VE
GND
POWER ON
NC
PV/PH
GND
4.43/3.58
NC
NC
BF401
0005M MAIN
VIDEO
SERVO/LOGIC
PIF
ACE HEAD
BS031
GND
ERASECTL
A LIN REC
A LIN PB
NC
PB REC CTRL
C BIAS
FFC
CONTROL HEAD
AUDIO HEAD
A.E.HEAD
FULL ERASE HEAD
BS030
Board To Board
FULL ERASE HEAD
GND
F.E.HEAD
0110 POWER ASSY
0150M POWER
BP002
UH+
UH−
U5 −32VE
U3 +33VE
POWER GOOD
VM +20VE
VM +20VE
GND
GND
GND
GND
+14VE
+14VE
+6VE
+6VE
BW001
BP001
BS001
A-BIAS
A-LIN-PB
FOR TEST
BW005
PB-YC
GND
DRUM FF
CTL-OUT
FOR TEST
CAPSTAN MOTOR
BT001
Board To Board
CAP Vcc
MOTOR GND
GND
FGA
FGB
CFG REF
CDIR F/R
LIMITER
CAP ERR
A VCC1
CAPSTAN MOTOR
M
0200 KDB/FCB/JSB ASSY
0212M FCB
BE05
+12VS
GND
BE401
+12VS
GND
BT003
+6VEI_IR
VKK(−32V)
UH−
UH+
GND
+5VD
KDB CLOCK
S_K_DAT
K_S_DAT
KDB STROBE
REMOTE
KDB RESET
+14VE
CAM P
BE04
MIC IN
GND
NC
NC
BE01
F VIDEO IN
GND
F AUDIO L
GND
F AUDIO R
GND
WK03
BK01B
NC
KEY 3
KEY 4
GND
MIC DET
SYSTEM 4
SYSTEM 3
3DNR
POWER LED
0210M KDB
BK01A
NC
KEY 3
KEY 4
GND
MIC DET
SYSTEM 4
SYSTEM 3
3DNR
POWER LED
BK02
+6VEI_IR
VKK(−32V)
UH−
UH+
GND
+5VD
KDB CLOCK
S_K_DAT
K_S_DAT
KDB STROBE
REMOTE
KDB RESET
+14VE
CAM P
0213M JSB
BK03A
S 1
S 2
S 3
+5V
S 4
GND
J 2
J 1
BK03B
S 1
S 2
S 3
+5V
S 4
GND
J 2
J 1
LOADING MOTOR/CAM SW
BT002
LO OUT
LO IN
GND
CAM A
CAM B
CAM 2
FFC
MODE MOTOR
CAM SW
M

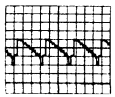

0100 MAIN ASSY
0030M TERMINAL
BX003
F VIDEO IN
GND
F AUDIO L
GND
F AUDIO R
GND
I/O
MPX/AUDIO
BN004
MIC IN
GND
NC
NC
BF101
+12VE
C SYNC
GND
EE PB (MOD)
GND
V EE PB
GND
EE PB I
NC
NC
NC
NC
BX101
A-EE-PB-MOD
U4 +12VE
V-EE-REC
GND
V-IF
GND
IIC-CLK-EV
IIC-DA-EV
GND
V-EE-PB
U7 +5VE
CSYNC
SCART2
SCART-ON
V-EE-PB-MOD
BX002
A-IF
ERASE CTL
GND
A-LIN-REC
A-LIN-PB
GND
NC
NC
AUDIO-MUTE
REC ON
U2 +5VS
U6 +9VS
GND
IIC-CLK-SW
IIC-DA-SW
AUDIO-ENV
HIFI-DET-IN
R-LEVEL
CL-LEVEL
BN002
SIF
SIF-GND
BN601
SIF
SIF-GND
BN301
IIC-DA-EV
IIC-CLK-EV
GND
MPX-ERR
+8VE
VIDEO INSERT
FE-CTL-HIFI
BN003
AUDIO FF
REC ON
REC HIFI FM
GND
PB HIFI FM
U2 +5VS
FPC
CYLINDER ASSY
PRE AMP
AUDIO FF
REC ON
REC HIFI FM
GND
PB HIFI FM
U2 +5VS
ROTARY
TRANS
SP1
SP2
LP1
LP2
HIFI1
HIFI2
BV001
GND
REC YC
U2 +5VS
HD CSYNC
DFFHASEL
HD VIDEO ENV
COMPARATOR
PB YC
NC
GND
FPC
0094M 3DNR
BF301
FSC 1
GND
PB COLOR
WV081
FSC 1
WV101
PB COLOR
BF202
+12VE
C SYNC
GND
EE PB (MOD)
GND
V EE PB
GND
EE PB I
NC
NC
NC
NC
BF402
BF401
IIC D SW
IIC CLK SW
NC
+6VE
GND
POWER ON
NC
PV/PH
GND
4.43/3.58
NC
NC
0005M MAIN
VIDEO
SERVO/LOGIC
PIF
0110 POWER ASSY
0150M POWER
BP002
BP001
BW001
UH+
UH-
U5 -32VE
U3 +33VE
POWER GOOD
VM +20VE
VM +20VE
GND
GND
GND
+14VE
+14VE
+14VE
+6VE
+6VE
0200 KDB/FCB/JSB ASSY
0212M FCB
BE05
+12VS
GND
BE401
+12VS
GND
BT003
+6VE(-IR
VAK(-32V)
UH-
UH+
GND
+5VD
KDB CLOCK
S_K_DAT
K_S_DAT
KDB STROBE
REMOTE
KDB RESET
+14VE
CAM P
BE04
MIC IN
GND
NC
NC
BE01
F VIDEO IN
GND
F AUDIO L
GND
F AUDIO R
GMD
WK03
BK01B
NC
KEY 3
KEY 4
GND
MIC DET
SYSTEM 4
SYSTEM 3
3DNR
POWER LED
0210M KDB
BK01A
NC
KEY 3
KEY 4
GND
MIC DET
SYSTEM 4
SYSTEM 3
3DNR
POWER LED
BK02
+6VE(-IR
VAK(-32V)
UH-
UH+
GND
+5VD
KDB CLOCK
S_K_DAT
K_S_DAT
KDB STROBE
REMOTE
KDB RESET
+14VE
CAM P
BK03A
S 1
S 2
S 3
+5V
S 4
GND
J 2
J 1
0213M JSB
BK03B
S 1
S 2
S 3
+5V
S 4
GND
J 2
J 1
ACE HEAD
BS031
GND
ERASECTL
A LIN REC
A LIN PB
NC
PB REC CTRL
C BIAS
FFC
CONTROL HEAD
AUDIO HEAD
A.E.HEAD
FULL ERASE HEAD
BS030
Board To Board
FULL ERASE HEAD
GND
F.E.HEAD
BS001
A-BIAS
A-LIN-PB
FOR TEST
BW005
PB-YC
GND
DRUM FF
CTL-OUT
FOR TEST
CAPSTAN MOTOR
BT001
Board To Board
CAP Vcc
MOTOR GND
GND
FGA
FGB
CFG REF
CDIR F/R
LIMITER
CAP ERR
A VCC1
CAPSTAN MOTOR
LOADING MOTOR/CAM SW
BT002
LO OUT
LO IN
GND
CAM A
CAM B
CAM 2
FFC
MODE MOTOR
CAM SW

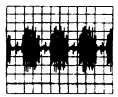
0005M MAIN(VIDEO)

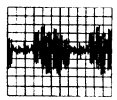


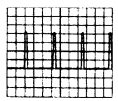
① IV001, Pin ⑮ E-9 ② IV001, Pin ⑮ E-9 ③ IV001, Pin ⑰ E-9 ④ IV001, Pin ㉑ D-9 ⑤ IV001, Pin ⑨ G-7 ⑥ IV001, Pin ㊳ D-4 ⑦ IV001, Pin ㊺ E-4 ⑧ IV001, Pin ㊻ E-4 ⑨ TV011, Emitte

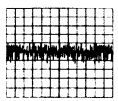

PLAY
V:100mV/div
H:5ms/div


PLAY
V:100mV/div
H:20μs/div

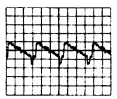

PLAY
V:50mV/div
H:20μs/div

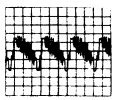

PLAY
V:50mV/div
H:10μs/div

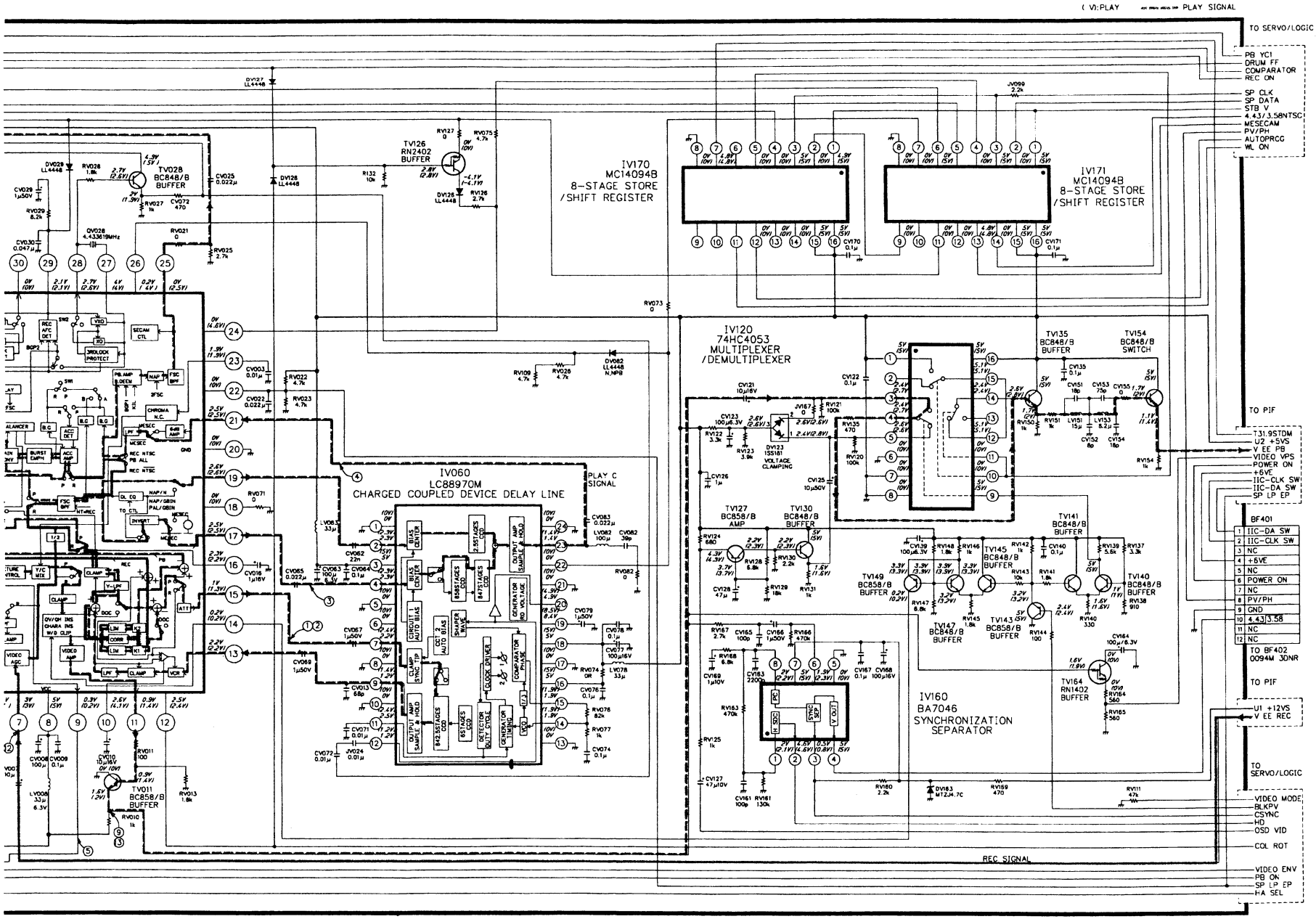

PLAY
V:1V/div
H:20μs/div


PLAY
V:100mV/div
H:10ms/div

PLAY
V:100mV/div
H:50μs/div

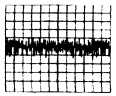

PLAY
V:200mV/div
H:20μs/div





i-7 ⑥ IV001, Pin ㊳ D-4 ⑦ IV001, Pin ㊻ E-4 ⑧ IV001, Pin ㊺ E-4 ⑨ TV011, Emitter (75Ω load) G-7 ⑩ IV001, Pin ㊳ D-4 ⑪ IV001, Pin ㊹ E-4 ⑫ IV001, Pin ⑦ F-6 ⑬ TV011, Emitter (75Ω load) G-7

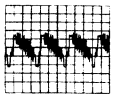
div
S/div



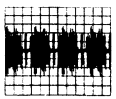
PLAY
V:100mV/div
H:10ms/div

PLAY
V:100mV/div
H:50μs/div

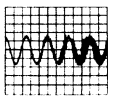
PLAY
V:200mV/div
H:20μs/div



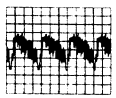
PLAY
V:50mV/div
H:20μs/div



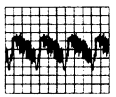
REC (SP)
V:50mV/div
H:20μs/div



REC (SP)
V:200mV/div
H:0.1μs/div

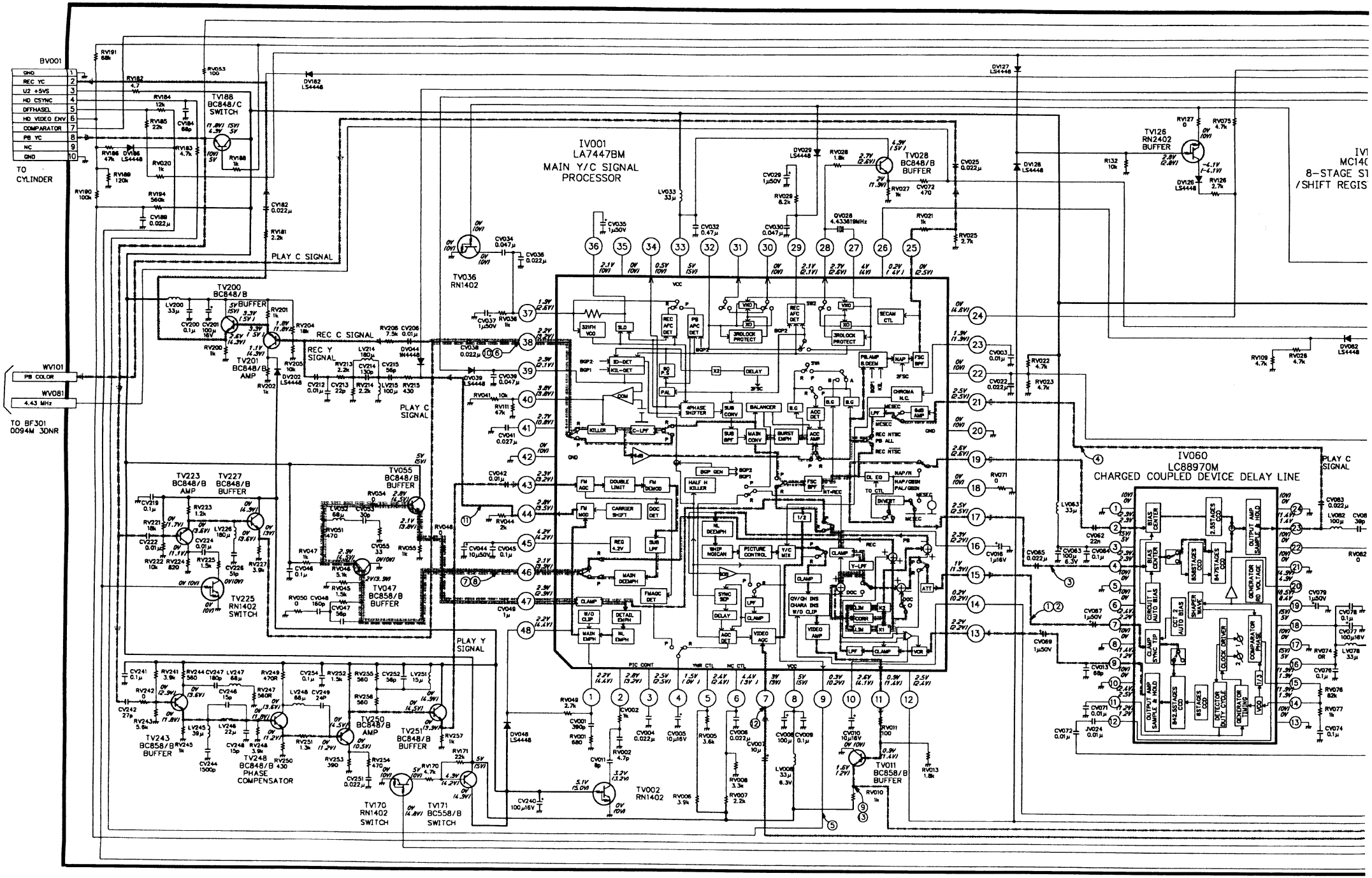


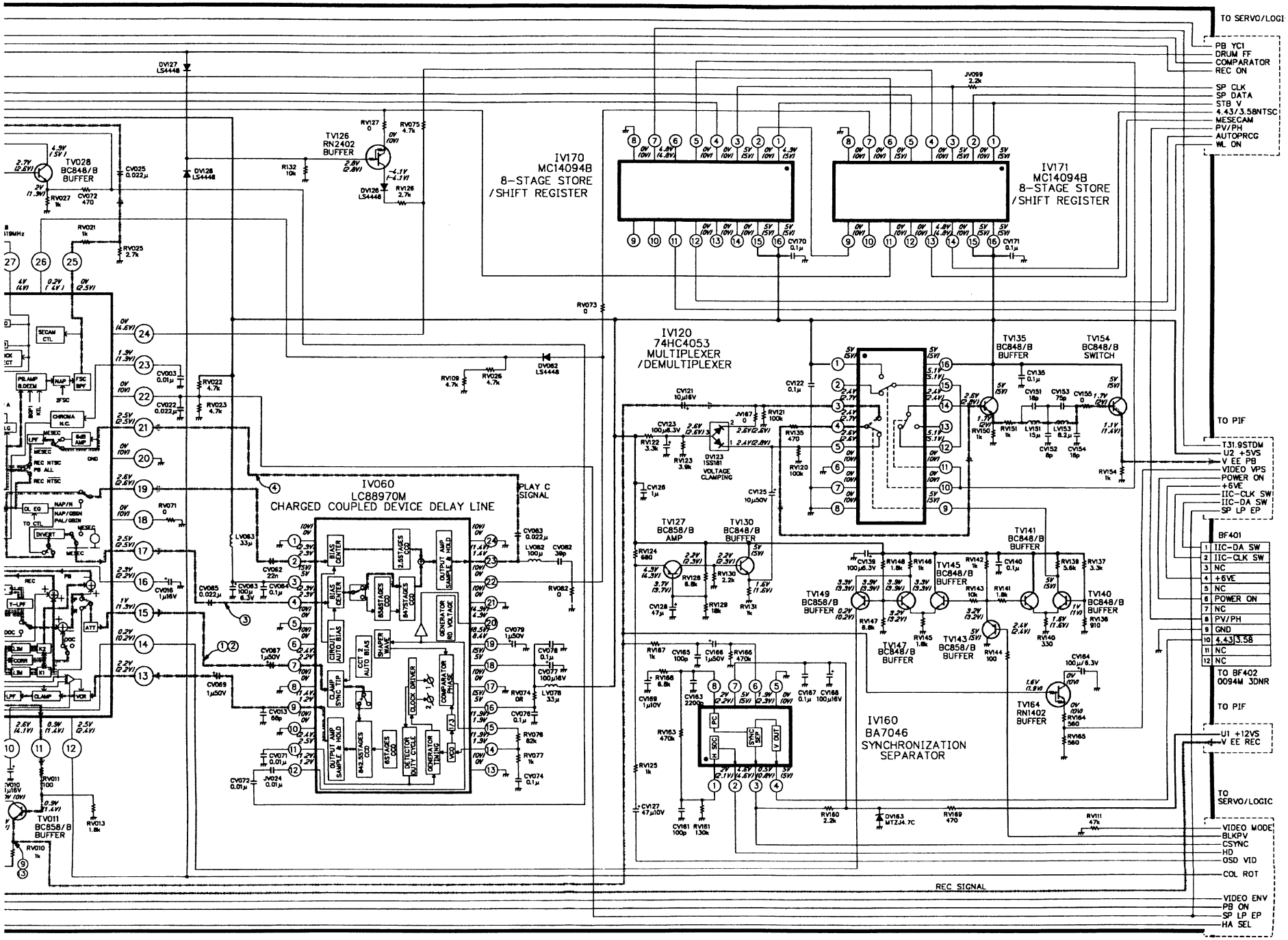
REC
V:100mV/div
H:20μs/div

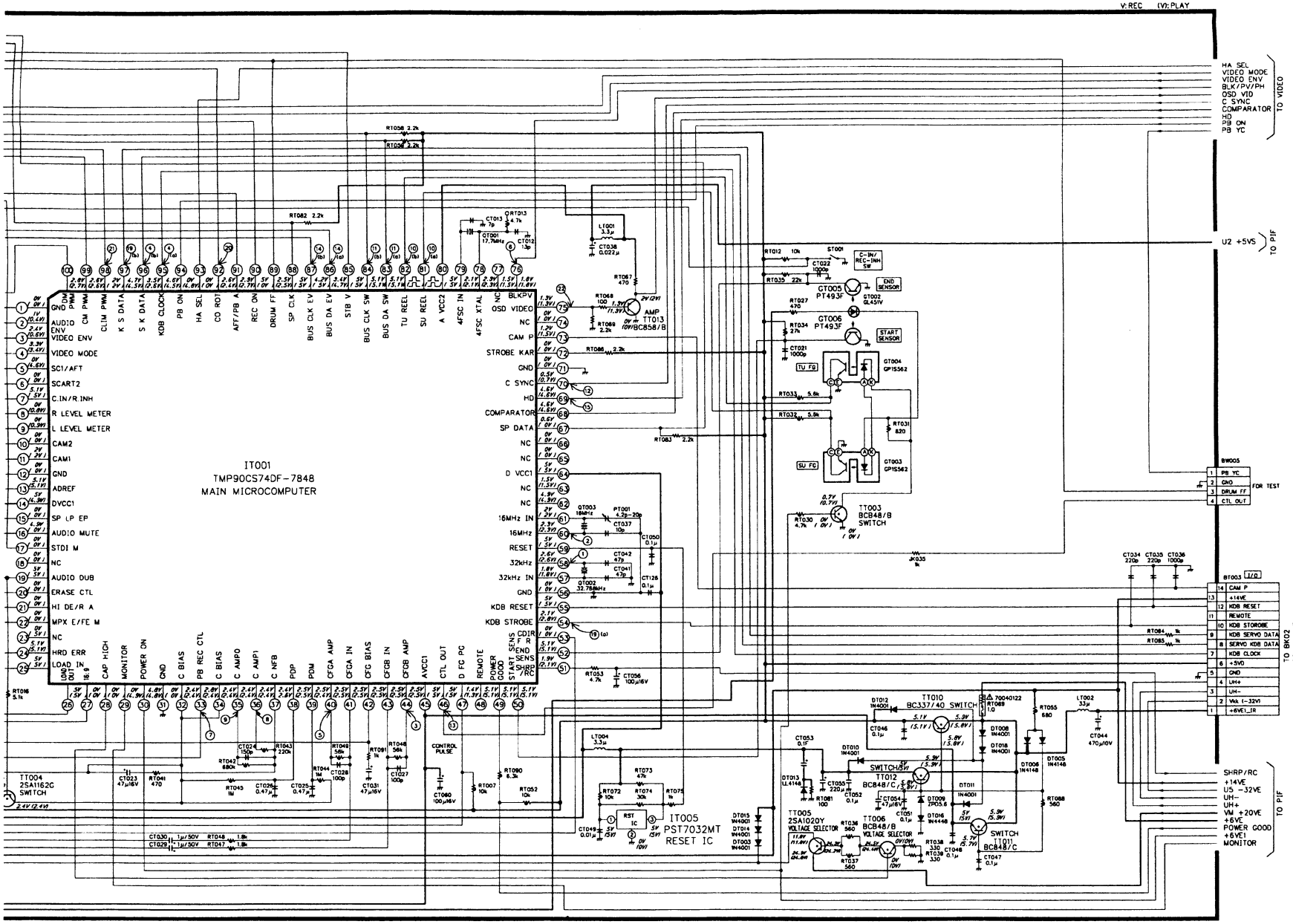


REC
V:500mV/div
H:20μs/div

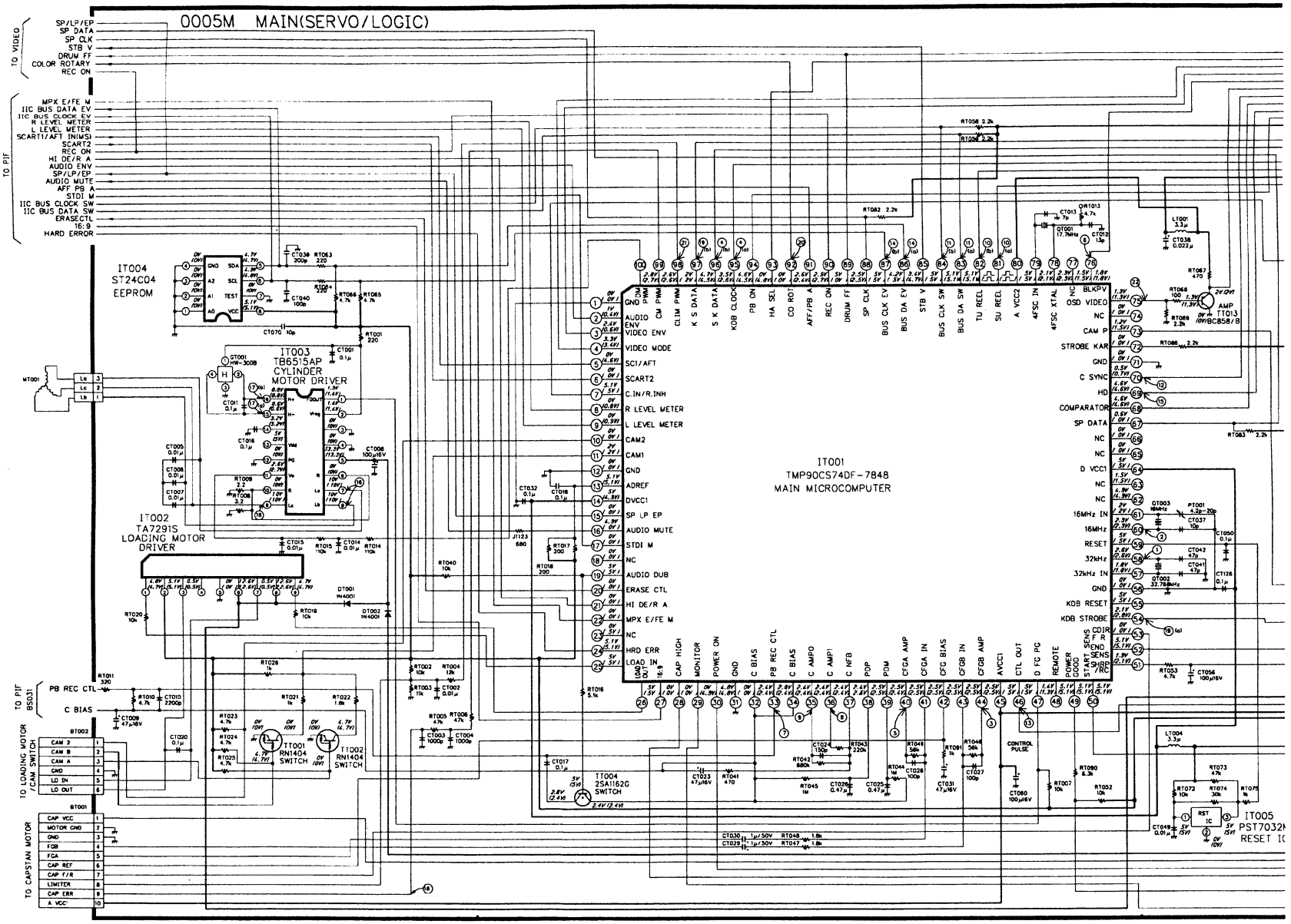
0005M MAIN(VIDEO)



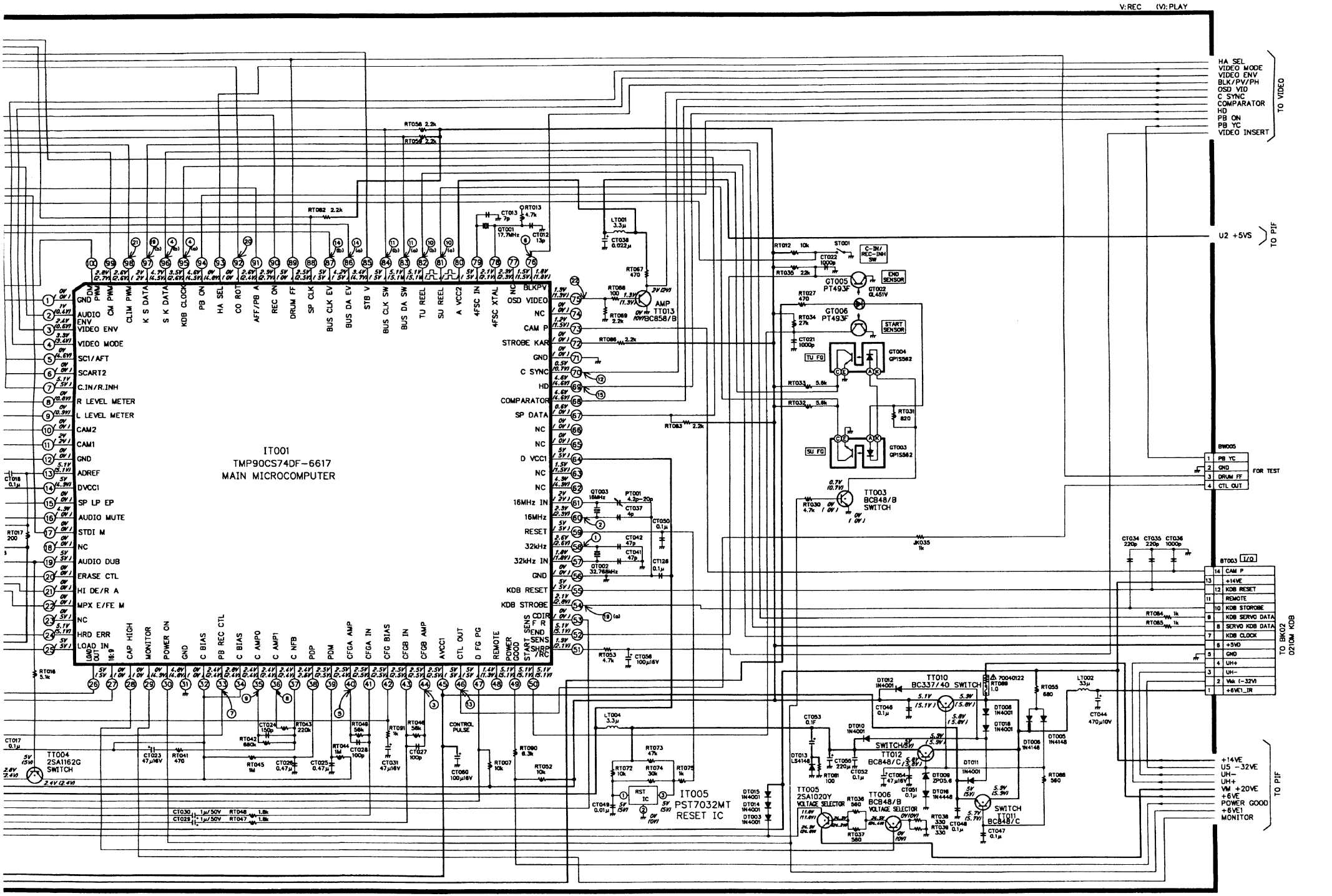

IV170
MC14094B
8-STAGE STORE
/SHIFT REGISTER
IV171
MC14094B
8-STAGE STORE
/SHIFT REGISTER
IV120
74HC4053
MULTIPLEXER
/DEMULTIPLEXER
IV060
LC88970M
CHARGED COUPLED DEVICE DELAY LINE
IV160
BA7046
SYNCHRONIZATION
SEPARATOR
TV028
BC848/B
BUFFER
TV126
RN2402
BUFFER
TV011
BC858/B
BUFFER
TV127
BC858/B
AMP
TV130
BC848/B
BUFFER
TV135
BC848/B
BUFFER
TV154
BC848/B
SWITCH
TV141
BC848/B
BUFFER
TV145
BC848/B
BUFFER
TV149
BC858/B
BUFFER
TV147
BC848/B
BUFFER
TV143
BC858/B
BUFFER
TV140
BC848/B
BUFFER
TV164
RN1402
BUFFER
PLAY C
SIGNAL
REC SIGNAL
TO SERVO/LOGI
PB YC1
DRUM FF
COMPARATOR
REC ON
SP CLK
SP DATA
STB V
4.43/3.58NTSC
MESECAM
PV/PH
AUTOPRCG
WL ON
TO PIF
T31.9STDM
U2 +5VS
V EE PB
VIDEO VPS
POWER ON
+6VE
IIC-CLK SW
IIC-DA SW
SP LP EP
BF401
1 IIC-DA SW
2 IIC-CLK SW
3 NC
4 +6VE
5 NC
6 POWER ON
7 NC
8 PV/PH
9 GND
10 4.43/3.58
11 NC
12 NC
TO BF402
0094M 3DNR
TO PIF
U1 +12VS
V EE REC
TO
SERVO/LOGIC
VIDEO MODE
BLKPV
CSYNC
HD
OSD VID
COL ROT
VIDEO ENV
PB ON
SP LP EP
HA SEL


V: REC (V): PLAY
IT001
TMP90CS74DF-7848
MAIN MICROCOMPUTER
IT005
PST7032MT
RESET IC
TT004
2SA1162G
SWITCH
TT005
2SA1020Y
VOLTAGE SELECTOR
TT006
BC848/B
VOLTAGE SELECTOR
TT003
BC848/B
SWITCH
TT010
BC337/40 SWITCH
TT012
BC848/C
SWITCH
TT011
BC848/C
SWITCH
GT005
PT493F
GT006
PT493F
GT004
GP1S562
GT003
GP1S562
AMP
TT013
BC858/B
HA SEL
VIDEO MODE
VIDEO ENV
BLK/PV/PH
OSD VID
C SYNC
COMPARATOR
HD
PB ON
PB YC
TO VIDEO
U2 +5VS
TO PIF
FOR TEST
TO BK02
0210M KDB
SHRP/RC
+14VE
U5 -32VE
UH−
UH+
VM +20VE
+6VE
POWER GOOD
+6VE1
MONITOR
TO PIF
F-9 ④ IT001
(a) Pin ㊳ (KDB CLOCK) C-7
(b) Pin ㊴ (S K DATA) C-7
⑤ IT001, Pin ㊵
F-8 ⑥ IT001, Pin ㊶
C-9 ⑦ IT001, Pin ㊷
F-7 ⑧ IT001, Pin ㊸
F-8 ⑨ IT001, Pin ㊹
F-7 ⑩ IT001
(a) Pin ㊺ SP PLAY C-9
(b) Pin ㊻ SP PLAY C-9
⑪ IT001
(a) Pin ㊼ C-8
(b) Pin ㊽ C-8
CFGA AMP SP PLAY
PV/PH/BLK STILL
R/P CTL REC
C AMP1 FF (SP)
C AMP0 PLAY (SP)
⑬ IT001, Pin ㊾
⑭ IT003 Pin ⑦, ⑧
Pin ⑨
⑰ IT003
(a) Pin ⑮
(b) Pin ⑯
⑱ BT001, Pin ③
⑲ IT001
(a) Pin ㊿ (KDB STROBE) E-10
(b) Pin (51) (K→S DATA) C-7
⑳ IT001, Pin (52)
㉑ IT001, Pin (53)
㉒ IT001, Pin (54)
HD
CAP ERR SP SLOW
COLOR ROTARY (SP)
CAP
OSD VIDEO

Servo Logic Diagram



(V-857 B)


V: REC (V): PLAY
IT001
TMP90CS74DF-6617
MAIN MICROCOMPUTER
IT005
PST7032MT
RESET IC
TT003
BC848/B
SWITCH
TT004
2SA1162G
SWITCH
TT005
2SA1020Y
VOLTAGE SELECTOR
TT006
BC848/B
VOLTAGE SELECTOR
TT010
BC337/40 SWITCH
TT011
BC848/C
SWITCH
TT012
BC848/C
SWITCH
TT013
BC858/B
AMP
GT005
PT493F
GT006
PT493F
GT004
GP1S562
GT003
GP1S562
GT002
GL451V
C-IN/
REC-INH
SW
END
SENSOR
START
SENSOR
TU FG
SU FG
HA SEL
VIDEO MODE
VIDEO ENV
BLK/PV/PH
OSD VID
C SYNC
COMPARATOR
HD
PB ON
PB YC
VIDEO INSERT
TO VIDEO
U2 +5VS
TO PIF
BW005
PB YC
GND
DRUM FF
CTL OUT
FOR TEST
BT003
I/O
CAM P
+14VE
KDB RESET
REMOTE
KDB STROBE
KDB SERVO DATA
SERVO KDB DATA
KDB CLOCK
+5VD
GND
UH+
UH-
Vbk (-32V)
+6VE1_IR
TO BK02
0210M KDB
+14VE
U5 -32VE
UH-
UH+
VM +20VE
+6VE
POWER GOOD
+6VE1
MONITOR
TO PIF

0005M MAIN(SERVO/LOGIC)